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DISEASES CAUSED BY BACTERIA AND FUNGI

Pedersen, P. S. (1960). **Bacteriological diagnosis of mastitis. III. Titration of staphylococcal-β-toxin.** — Nord. VetMed. **12,** 749-768. [In English. Summaries in German and Danish.] **1671**

Four methods of titrating β-toxin were compared on five batches of broth cultures. Two methods judged suitable for routine use were (a) the CAMP reaction and (b) a toxin diffusion method, which measured the extent of diffusion of toxin in blood-agar plates after incubation for 24 hours. Full details of the methods are given.—R.M.

Girlando, M. & Brucchieri, A. (1960). Sinergismo ed antagonismo fra gli antibiotici: ricerche con lo Staph. aureus. **[Synergy and antagonism between antibiotics: studies with Staphylococcus aureus.]**—Boll. Ist. sieroter., Milano **39,** 405-411. [Summary in English.] **1672**

Tests were made with 30 coagulase-positive strains of *Staph. aureus* isolated from man. Synergic activity was observed with the combinations: erythromycin-chlortetracycline (against 5 of 6 strains); erythromycin-oxytetracycline (12 of 18); erythromycin-chloramphenicol (4 of 7); streptomycin-chlortetracycline (2 of 4). Antagonism was observed with: streptomycin-chloramphenicol (7 of 10); penicillin-chloramphenicol (7 of 10); penicillin-oxytetracycline (6 of 10).

—T.E.G.R.

Yotis, W. W. & Ekstedt, R. D. (1960). **Studies on staphylococci. III. Further studies on purification and mechanism of action of an antibacterial human serum factor.**—J. Bact. **80,** 719-725. **1673**

The factor was found almost exclusively in the water-soluble globulin fraction of the serum. When used in sufficient concentration, it killed the staphylococci. Its effect on other bacteria was investigated and sera of other animals examined for similar factors. The effect of time of exposure, ionic strength and pH were investigated and some of the physical and chemical properties of the factor described. Its mode of action was discussed.

—Ian Davidson.

Alami, S. Y. & Kelly, F. C. (1960). **Influence of coagulase and route of injection on staphylococcal virulence in mice.**—Proc. Soc. exp. Biol., N.Y. **105,** 589-591. [Authors' summary modified.] **1674**

Studies with 12 staphylococcal strains grouped according to free or bound coagulase (the so-called clumping factor) indicate that the route of injection has little or no effect on the virulence of *Staph. aureus* for mice. Mucin markedly enhanced virulence of coagulase-positive, clumping factor-negative staphylococci (but not of other strains) injected i/p. Coagulase (free or bound) did not appear to be a critical factor of virulence for mice.

Klastrup, O. (1960). Celletaellinger på leverandørmaelk. **[Cell counts on churn milk.]** — Nord. VetMed. **12,** 621-638. [In Danish. Summaries in English and German.] **1675**

Cell counts were made on milk from 10 dairy districts (1,432 herds) sampled 4 times during a year. Average counts from healthy herds were around 10,000 cells/ml. Counts of 500,000 or above were regarded as evidence of mastitis: the average for herds with streptococcal mastitis was between 715,000 and 795,000. Cell counts were of prognostic value in infection with Group B streptococci, since in herds successfully treated the counts before treatment were lower than in herds where treatment was not successful. The role of non-specific mastitis was discussed. K's

survey revealed evidence of mastitis in 97% of herds. Over a quarter of the cows had mastitis and in 67% of these the cell count of milk was over 500,000.—R.M.

Mura, D. & Pisanu, S. (1960). Sulla diffusa presenza, nelle infezioni mastitiche bovine, dello Streptococcus agalactiae contenente l'antigene proteico-non specifico "R". **[Widespread incidence in Sardinia of Streptococcus agalactiae having non-specific R antigen.]**—Vet. ital. **11**, 874-881. [Summaries in English, French and German.] **1676**

Of 120 strains of *Str. agalactiae* isolated from the milk of cows with mastitis 92 did not possess the polysaccharide type antigen and possessed the non-specific protein R antigen. It is considered that the presence of this antigen in the udder would exclude the possibility of different type strains being present at the same time.—T.E.G.R.

Rettenmaier, L. (1960). Hämolysierende Diplo-Strepto-Coccen als Erreger einer Deckinfektion. Ein Beitrag zum Problem des ansteckenden Scheidenkatarrhs. **[Haemolytic streptococci as agents of contagious catarrhal vaginitis in cows.]** — Tierärztl. Umsch. **15**, 361-364. **1677**

An infertile bull was slaughtered and testicular lesions were associated with haemolytic streptococci; no other organisms were identified. A second bull developed orchitis and streptococci were isolated from its semen, also from vaginal mucus from 6 of 8 cows with catarrhal vaginitis, which had been served by the bull.—R.M.

Holec, J. (1960). Elektroforéza bílkovin mléčného séra se zřetelem k průkazu původu mléka z prostředí zamořeného tuberkulózou. **[Diagnostic aspects of electrophoresis of whey proteins in bovine tuberculosis.]**—Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5**, 641-654. [In Czech. Summaries in English and Russian.] **1678**

Paper-electrophoretic analysis of whey showed that immune globulin levels were higher in samples from fifty-two dairy cows with positive tuberculin reactions, than in 30 samples from non-reactors. The possible diagnostic significance of these findings was discussed.—E.G.

Nassal, J. (1961). Nachweis von Tuberkulosebakterien in der Milch von tuberkulinpositiven und -negativen Kühen aus neuinfizierten Rinderbeständen. **[Demonstration of tubercle bacilli in milk of positive and negative reactors from newly infected herds.]** —Tierärztl. Umsch. **16**, 34-37. **1679**

In newly infected herds tubercle bacilli were demonstrated in 36 of 212 milk samples from tuberculin reactors, and in 7 of 145 from non-reactors. About 12% of all cows in such herds, whether reactors or non-reactors were said to be excreting bacilli.

In reacting cows human type bacilli were demonstrated in 3 of 64 samples from herds where infection was believed to be from attendants. Bovine type bacilli were demonstrated in 11 of 57 samples from herds where infection was believed to have been contracted from attendants, and in 7 of 14 samples from herds where the source of infection was believed to be cattle. Avian type bacilli were demonstrated in 13 of 48 samples from herds in which infection was believed to have been from infected poultry and in 2 of 29 samples from a herd where infection was thought to be from a cat.—E.G.

Fried, K. & Jantošovič, J. (1961). Príspevok k diagnostike kostnej tuberkulózy sliepok. **[Diagnosis of tuberculosis of the bones in fowls.]** — Veterinářstvi **11**, 11-14. [In Slovak.] **1680**

Details were given of clinical and P.M. diagnosis of TB. of the long bones in 22 of 25 tuberculous fowls. Advanced bone lesions were also demonstrable radiologically and appeared as atrophy or destruction of compact bone substance around caseous tuberculous nodules in the bone cavity. The breast bone was affected in 5 fowls.—E.G.

Previtera, A. & Agrimi, P. (1960). Attività biologica della tubercolina da usarsi per il controllo della infezione tubercolare nei bovini. **[Biological activity of tuberculin produced in Italy.]** — Zooprofilassi **15**, 5-28. **1681**

Statistical and comparative titrations were made on g.pigs and cattle with P.P.D. tuberculin, produced at the Rome Zooprophylactic Institute; International Standard (Weybridge mammalian intradermal P.P.D.); and 5 other types of so-called standard tuberculin produced by various Institutes in Italy. Titres of Rome P.P.D. closely approximated those of Weybridge P.P.D. tuberculin; those of the other tuberculins were much lower. —T.E.G.R.

I. Cavrini, C. & Gasparini, U. (1960). Sulla valutazione della reazione tubercolinica intradermica semplice. **[Interpretation of the**

single intradermal tuberculin reaction.] — Nuova Vet. **36,** 279-285. [Summaries in English and French.] **1682**

II. Cavrini, C. & Gasparini, U. (1960). Contributo allo studio delle reazioni tuberco-liniche provocate dal micobatterio aviario nella specie bovina. **[Tuberculin reactions in cattle, due to avian type Mycobacterium tuberculosis.]** — Nuova Vet. **36,** 299-312. [Summaries in English and French.] **1683**

I. It is concluded that a better evaluation can be made if reactions are read at the 72nd and at the 96th hour, especially in animals over 4 years undergoing the test for the first time. The Stormont test and the effect of age of animals and stage of disease on reactions are discussed.

II. The single i/d comparative tuberculin test was applied to 171 cattle originally free from TB. but kept in close contact with infected fowls; positive or doubtful reactions to avian tuberculin were observed in 41 while 8 animals gave positive reactions to both avian and mammalian tuberculin. In young cattle there was a higher percentage of reactors, reactions were more severe and developed more rapidly than in adult cattle. For the recording of reactions the 96th hour is considered more suitable than the 72nd. In animals infected with avian TB. reactions were stronger with avian than with mammalian tuberculin though in some cases the difference was slight. In young bulls experimentally infected with avian type organisms the reaction to avian tuberculin was not affected by the number of bacilli inoculated, whereas the reaction to mammalian tuberculin was affected.—T.E.G.R.

Magnusson, M. (1961). **Specificity of mycobacterial sensitins. I. Studies in guinea pigs with purified "tuberculin" prepared from mammalian and avian tubercle bacilli, Mycobacterium balnei, and other acid-fast bacilli.** —Amer. Rev. respir. Dis. **83,** 57-68. [Summaries in French and Spanish.] **1684**

Magnusson, M., Engbaek, H. C. & Bentzon, M. W. (1961). **Specificity of mycobacterial sensitins. II. Studies in guinea pigs with purified sensitin prepared from unclassified acid-fast bacilli.** — Ibid. 69-84. [Summaries in French and Spanish.] **1685**

I. M. described a method for measurement of the specificity of purified sensitin in sensitized g.pigs, and the findings obtained with 16 sensitin preparations. The sensitins were preparations from 4 human strains of tubercle bacilli, 4 bovine strains (including BCG), 3 avian strains, one *Mycobacterium balnei* strain, one *M. smegmatis* strain, and 3 other strains of acid-fast bacilli (unidentified).

II. The authors studied purified sensitin from several other strains of acid-fast bacilli, including photochromogenic and Battey strains and other unclassified strains.—R.M.

Mikhaĭlyukov, N. D. (1959). **[Morphological changes in the intestine of chicks given BCG by mouth.]**—Trudy Voronezh. zootekh.-vet. Inst. **16,** 241-244. [In Russian.] **1686**

Thirty 3-day-old chicks were each given BCG three times on alternate days: each dose consisted of 0·15 mg. of bacteria in 0·2 ml. water. These birds and 30 untreated controls were killed between 5 days and 6 months later. Two months after administration of BCG there were hyperplastic lesions the size of millet seeds in the intestinal mucosa that resembled TB. granuloma except that tissue reaction was more localized.—R.M.

Xalabarder, C. (1961). **The so-called problem of unclassified mycobacteria. A review.** — Amer. Rev. respir. Dis. **83,** 1-15. [Summaries in French and Spanish. Author's summary modified.] **1687**

The studies reviewed seem to prove that mycobacteria constitute a single group of organisms but with gradations of progressive change. Their final and most clear-cut stage is represented by the pathogenic strains. Such a change is reversible and therefore a saprophytic strain may become virulent and *vice versa.* This has been achieved *in vitro,* and so it may also take place *in vivo.*

This concept of the phylogenetic unity of mycobacteria has been defended by many investigators, so it is not surprising that the so-called "atypical" or "unclassified" mycobacteria are found to originate from pathogenic organisms, whether spontaneously or under the influence of antimicrobial drugs. The contrary opinion is based on theoretical considerations which are quite reasonable but which, for lack of convincing proof, cannot be accepted at the moment.

Almejew, C. (1960). Die chronisch-produktive Form der Paratuberkulose des Rindes. **[Chronic form of Johne's disease in cattle.]** —Mh. VetMed. **15,** 883-887. **1688**

Inflammatory lesions are not very distinct in chronic Johne's disease. A more striking feature is the local proliferation of mesen-

chymal and reticulo-endothelial cells. Diffuse, rarely focal infiltration with epithelioid, lymphatic and giant cells, is very distinct. Cell infiltrations differ from those in TB. or glanders by the absence of caseation or calcification. Characteristic is the development of giant cells in hyperplastic tissue, consisting of epithelioid cells with slight regressive changes. Mast cells are always present, they may develop from adventitial cells of vessels and from lymphoid elements. Epithelioid cell infiltration is a valuable diagnostic aid.—E.G.

Katič, I. (1960). Et tilfaelde af paratuberkulose hos en dvaergged. **[Johne's disease in a goat.]** — Nord. VetMed. **12,** 797-804. [In Danish. Summaries in English and German.] **1689**

A herd of 26 African dwarf goats was imported into Copenhagen Zoo from Germany in October 1959. In December of that year one of them developed diarrhoea, emaciation and anaemia, and died. There was infestation with liver flukes and trichostrongyles. Groups of acid-fast bacilli were demonstrated histologically in epithelioid cells of the jejunum, in mesenteric lymph nodes, and in a thrombus within a branch of the portal vein. No giant cells were seen. No cultures were made. The rest of the herd was examined and only one was positive (at 1 : 20) to the c.f. test for Johne's disease, and had acid-fast bacilli in the faeces. Another was positive to the c.f. test at 1 : 20 and 1 : 40, but its faeces were negative.—R.M.

Novikova, M. P. (1960). **[The complement fixation test for paratuberculosis.]** — Veterinariya, Moscow No. 11 pp. 49-52. [In Russian.] **1690**

Of about 20,000 cattle and sheep, 6·9% of cattle and 14·6% of sheep reacted to the c.f. test for Johne's disease, compared with 0·7% of cattle and 2·1% of sheep to the allergic test using avian tuberculin. It was recommended that the tests be used together in the diagnosis of Johne's disease. The author has previously described her method for preparing antigen for the test [see *V.B.* **30,** 3476].—M.G.G.

Hartwigk, H. (1961). Atypische Merkmale von Corynebakterium (C.) pyogenes beim Rind. **[Atypical characteristics of Corynebacterium pyogenes in cattle.]** — Dtsch. tierärztl. Wschr. **68,** 38-41. [Summary in English.] **1691**

Variants of *C. pyogenes,* characterized by absence of gelatinase activity and failure to peptonize litmus milk, were isolated from the genital organs of 15 of 105 cows. In other characteristics they did not differ from typical strains. Antigenic differences between typical and atypical strains have not been established. —E.G.

Benedek, G., Tölgyesi, G. & Stirling-Mócsy, M. (1961). **Some observations on horse infected artificially with Malleomyces mallei.** — Acta vet. Acad. Sci. hung. **11,** 65-72. [In English. Authors' summary modified.] **1692**

The authors infected a horse by passing a rubber tube through the nose to the pharynx and making the animal swallow the *Pfeifferella mallei* culture through the tube. Upon withdrawing the tube the mucous membrane of the nose became infected too.

Twenty-four hours after the infection the temperature rose to 41°C. and never fell below 39°C. during the 25 days of observation. The horse became rapidly thinner in spite of his good appetite. It was possible by this artificial infection to provoke the rare acute form of glanders.

The submaxillary lymph nodes became gradually swollen from the 4th and 5th day and a severe characteristic nasal discharge commenced on the 6th day.

Haematological and serological observations made during the experiment are recorded.

Shuman, R. D. (1960). **Experimental evaluation of culture and serum vaccination for the control of swine erysipelas. VI. Vaccination of weanling pigs farrowed by susceptible and immune dams. VII. Serum potency with relation to immunization of weanling pigs.** — J. Amer. vet. med. Ass. **137,** 468-472 & 473-476. **1693**

When vaccinated with virulent *Erysipelothrix rhusiopathiae* culture and varying amounts of hyperimmune serum, young pigs newly weaned from dams immune to the disease had less satisfactory immunizing responses than pigs newly weaned from susceptible dams. In the latter, culture-serum ratios of 1 : 5 and 1 : 10 produced immunizing effects. Although the majority of vaccinated pigs were classified after percutaneous exposure 89 days after vaccination as susceptible, they were less susceptible than non-vaccinated contact and litter controls.

Further pig protection tests showed that as the potency of hyperimmune serum was reduced by dilution, there was an increase in

the cutaneous reactions with consequent increase in subsequent immune response. The ARS Standard lot 10 serum is at least twice the strength of the "old" Standard Serum BAI lot 7 and is too strong for use in serum vaccination of newly weaned pigs.

—A. Ackroyd.

Nishimura, Y., Sato, U., Hanaki, T. & Kawashima, H. (1960). Die Forschung über den Schweinerotlauf. II. Über die Auswahlen von den negativ oder positiv reagierten Schweinen an perkutaner Infektion mittelst serologischer Untersuchungen. **[Swine erysipelas studies. II. Selection of susceptible pigs by means of serological tests.]** — Jap. J. vet. Sci. **22,** 241-247. [In German. Summary in Japanese.] **1694**

The authors tried on 60 unvaccinated pigs (40–60 kg. body wt.) the haemagglutination-inhibition and the growth-inhibition tests described by Wellman [*V.B.* **26,** 2501 & **30,** 3798], comparing them with serum protection tests on mice, and skin reaction to subsequent infection by scarification. The effect of vaccination and infection on antibodies was also studied. Only 2 of the 60 pigs gave negative serological tests yet reacted to scarification; another reacted severely to scarification but possessed serum antibodies. Apart from these 3 pigs, the serological tests gave sufficient indication of susceptibility to enable the pigs to be used for testing vaccines. In the authors' opinion, pigs that had recovered from infection, yet had the same low antibody titres as normal unvaccinated pigs, could be used to test vaccines. The period elapsing between recovery and testing was not clearly stated.

Seventeen pigs were inoculated with 5 or 50 ml. swine fever crystal violet vaccine and with a large dose of swine fever virus 21 days later. Serological tests for erysipelas done before inoculation of vaccine and 30–40 days after inoculation of virus failed to show significant changes in titres, and inoculated pigs did not appear to be more susceptible to erysipelas infection.—R.M.

Krauss, S., Janowski, H. & Mierzejewska, M. (1960). Dalsze obserwacje nad zmiennością niezjadliwych włoskowców różycy. II. Porównanie szczepu AV/R9 ze szczepem krajowym ST 55. **[Variability of avirulent E. rhusiopathiae strains. II. Strains AV/R9 and ST 55.]**—Roczn. Nauk rol. **69,** 413-431. [In Polish. Summaries in English and Russian.] **1695**

Strain ST 55 was avirulent for mice and pigs and of high immunogenicity for both species. Strain AV/R9, although avirulent for both species, produced immunity in mice but not in pigs.—E.G.

Liu, P. V. & Bates, J. L. (1961). **An extracellular haemorrhagic toxin produced by Listeria monocytogenes.** — Canad. J. Microbiol. **7,** 107-108. [Authors' introduction modified.] **1696**

Although *L. monocytogenes* infection often results in necrosis of tissues and rapid death, the factor responsible for this has not been produced *in vitro.* Since the bacterial cells of this species are relatively non-toxic, it is likely that some extracellular products are responsible. The infections by this species, therefore, were somewhat similar to the infections with *Bacillus anthracis.*

Recently the production of an extracellular toxin of *B. anthracis in vivo* and *in vitro* has been demonstrated [*V.B.* **29,** 10]. In this instance the failure to recognize the toxin in cultures was due to its early appearance and rapid disappearance under ordinary growth conditions. This preliminary note by Liu & Bates indicates that toxin production of *L. monocytogenes* may follow the same pattern.

Smith, G. R. (1961). **Further observations on the pathogenicity of Pasteurella haemolytica for young lambs.**—J. comp. Path. **71,** 94-99. [Author's conclusions modified.] **1697**

The virulence of *Past. haemolytica,* Types A and T, for lambs aged 3 weeks, was studied using intraperitoneal inoculation. Type A strains were from cases of enzootic pneumonia in adult sheep and Type T strains from septicaemia in lambs over the age of 6 months. Evidence of considerable virulence was obtained for Type A but not Type T strains. Adult sheep were highly resistant to both Types.

Binato, G. & Corrado, A. (1960). Infezione pseudotubercolare della cavia—tentativo di cura con antibiotici. **[Antibiotic therapy of pseudotuberculosis in guinea-pigs.]**—Nuova Vet. **36,** 239-242. [Summaries in English, German and Spanish.] **1698**

An outbreak of pseudotuberculosis in g.pigs was controlled by streptomycin (0·005 g. i/m daily for one week) or tetracycline (0·01 g. mixed with the food daily for one week). Treatment was repeated after a fortnight, for 5 days.—T.E.G.R.

Mora, E. C. & Edgar, S. A. (1960). **The control of fowl cholera with an experimental bacterin.**—Poult. Sci. **39,** 1277. **1699**

Three virulent strains of *Pasteurella multocida* were grown on solid media under conditions for optimum capsule formation. The cells were suspended in saline and heated, and a bactericidal adjuvant that removed most of the capsules of the cells was added. This vaccine was injected twice in 3 weeks into 67,000 chickens in 9 flocks with fowl cholera. Mortality decreased within 8 days and no birds developed chronic symptoms up to 8 months after vaccination.—M.G.G.

Masyukov, A. V. & Glebova, I. Y. (1961). **[Live vaccine against fowl cholera.]**—Veterinariya, Moscow No. 1 pp. 47-51. [In Russian.] **1700**

Working at the Krasnodar veterinary research institute the authors obtained a stable attenuated strain of *Past. multocida* (Strain K) by passage in g.pigs and frogs. This strain had morphological, cultural and biochemical properties typical of avian-type pasteurella. The minimum lethal dose for fowls was 0·1 ml. of a 24-hour broth culture by i/m inj., but the lethal dose did not cause typical lesions of fowl cholera and fowls which recovered did not become carriers.

The vaccine was used prophylactically on 379,000 fowls and 143,000 ducks. For fowls, cutaneous scarification on the anterior surface of the leg was preferred to i/m inj. or a feather-follicle method: 0·2 ml. of 48-hour culture on semi-fluid agar was applied with the aid of a knife. Of 184 chicks inoculated this way, 151 resisted 5–10 days later i/m inj. of 100 or 1,000 m.l.d. of a virulent strain. Duration of immunity was not stated. For ducks, i/m inj. was preferred to scarification or inoculation into the facial sinus; 0·2 ml. of culture gave protection for between 5 days and 6 months afterwards.

Of 303,270 fowls in healthy flocks inoculated prophylactically, 0·4% died in the 10 days before inoculation and 0·8% in the 10 days afterwards, while among 93,000 inoculated after an outbreak had commenced, 8·4% died 10 days before and 8·5% during 10 days after inoculation. Similar figures were given for ducks. Among 379,000 inoculated fowls, fowl cholera subsequently occurred (characterized by rapid death) on 3 farms (18,000 birds) and 1,032 died. Among 143,000 inoculated ducks, symptomless fowl cholera occurred on only two farms (9,430 birds). The period after inoculation within which these apparent breakdowns occurred is not stated.—R.M.

Ayalon, N., Neeman, L., Harrari, H. & Szidon, A. (1960). **[A newly-identified Haemophilus spp. associated with bovine vaginitis and cervicitis. II. Clinical observations and experimental transmission.]**—Refuah vet. **17,** 128-131. In Hebrew. [In English p. 153.] **1701**

The disease [see also *V.B.* **31,** 39] was reproduced in 7 heifers, though in a milder form than in natural cases, by instilling allantoic fluid from infected chick embryos on to the uterine cervix. Discharge and vaginal mucus from these heifers yielded the haemophilus for up to 7 months after infection, but in-contact controls showed no clinical changes and did not yield the organism. The infection was suspected to have been transmitted in the field by steers, themselves unaffected, although cultures of semen and preputial washings from 2 bulls mated with infected heifers were negative. No changes were observed in 2 cows infected conjunctivally with the organism, nor in 2 heifers infected intravaginally with *H. gallinarum*. Fertility was not affected, and heifers showing discharge conceived when inseminated. Isolation of a virus was not attempted.—M.G.G.

Széky, A. (1960). Adatok a ló és a sertés Bacterium pyosepticum okozta megbetegedésének kórszövettanához. **[Histology of Bact. viscosum equi infection in horses and pigs.]**—Mag. állator. Lapja **15,** 413-415. [In Hungarian. Summaries in English and Russian.] **1702**

Histological study was made of liver, kidney, nasal mucosa, lung, lymph nodes, small intestine, adrenal glands and brain of 22 horses aged 1½–6 years and 6 pigs, which died from *Bacterium viscosum equi* septicaemia. In liver and kidneys the main features were patchy hyperaemia, oedema, haemorrhages and bacterial emboli surrounded by degenerated or necrotic parenchyma cells but few or no histiocytes. In the kidneys of some horses (but in none of the pigs) scattered purulent foci were found. A detailed account is given of the findings. It was concluded that although the histological picture is not diagnostic, it is characteristic enough to evoke strong suspicion of the existence of *Bact. viscosum equi* septicaemia.—A. Sebesteny.

Müller, W.-D. (1960). Bakterielle Deckinfektion in einer Ziegenbockhaltung. [**Sterility in female goats associated with genital infection of the male with haemolytic Escherichia coli.**]—Tierärztl. Umsch. **15,** 406-407. **1703**

Conception rate was very low in a herd of 25 female goats and one male, even after replacement of the male. Haemolytic *E. coli* was isolated from cervical and vaginal mucus of 8 of 10 sterile goats and from the ejaculate of the male, which was affected with bilateral testicular hypoplasia. Conception rate improved dramatically after a single vaginal lavage with 40 ml. of a 20% supronal soln. and use of a new male.—E.G.

Pesti, L. (1960). **Classification of coli bacteria occurring in sucking pigs.**—Acta vet. Acad. Sci. hung. **10,** 365-374. [In English.] **1704**

Of 230 strains of *E. coli* from piglets which had died of gastroenteritis during the first week of life, 142 belonged to group O. Of these 88 to either O :9, O :21 or O :28. Of 170 strains from faeces of healthy piglets, 41 were of group O but not of the three groups mentioned. The possible role of groups O :9, O :21 and O :28 in diarrhoea of new-born piglets was discussed.—E.G.

Timoney, J. F. (1960). **An alternative method to repeated freezing and thawing for the preparation of an extract from a strain of haemolytic Escherichia coli which on intravenous injection in pigs mimics the syndrome of oedema disease.**—Vet. Rec. **72,** 1252. **1705**

Cultures of a strain of *E. coli* isolated from an outbreak of oedema disease were incubated at 37°C. for 7 days, then chilled, and treated with HCl to yield a precipitate, which was extracted with salt soln. buffered with phosphate. Typical symptoms of oedema disease developed in 3 of 5 pigs inoculated i/v with the extract.—M.G.G.

Ito, A. (1960). **Studies on hemolytic Escherichia coli strains isolated from edema disease of swine in Japan.**—Jap. J. vet. Res. **8,** 215-216. [In English.] **1706**

Of 18 haemolytic *E. coli* strains, isolated from 17 piglets with oedema disease, 12 belonged to the O139 : K82 (B) : H1 group and four to the O2 : K? : H1 group. One non-haemolytic strain was also isolated. Haemolytic strains were present in intestinal contents and mesenteric lymph nodes of affected carcasses, in faeces of convalescents and also in those of apparently healthy piglets. Forty-six strains from 185 slaughter pigs, 110 cattle, a number of horses and sheep did not belong to either of the O groups. Duodenal infection of rabbits with oedema disease strains and with haemolytic strains from a healthy pig resulted in acute, haemorrhagic enteritis and acute purulent peritonitis. Non-haemolytic strains had no such effect.—E.G.

Renault, L., Guillon, J.-C. & Palisse, M. (1960). Etude de quelques souches d'Escherichia coli isolées d'affections respiratoires chez les volailles. [**Strains of coli bacillus isolated from respiratory diseases of fowls.**] — Bull. Acad. vét. Fr. **33,** 495-499. **1707**

Of 74 strains of *E. coli* isolated, in fowls, from fibrinous lesions of the heart (46% of strains), of the liver (32%), of the air sacs (19%), of the lungs (2) and of the spleen (one strain), 24 caused fibrinous lesions of the heart and air sacs in chicks infected by the i/p route. There was no correlation between pathogenicity for chicks and sensitivity to antibiotics, sulphonamides or furazolidone.

—M.G.G.

Ward, P. A., Abell, M. R. & Johnson, A. G. (1961). **Studies on the adjuvant action of bacterial endotoxins on antibody formation. IV. Histologic study of cortisone-treated rabbits.** — Amer. J. Path. **38,** 189-205. [Authors' summary modified.] **1708**

A morphological investigation of the primary antibody response to bovine gamma globulin stimulated by *E. coli* endotoxin in cortisone-treated rabbits was described. Antibody production was associated with the appearance and proliferation of pyroninophilic reticular cells in the centres of splenic follicles.

Lenk, V., Rasch, K. & Bulling, E. (1960). Über das Vorkommen von S. paratyphi B (d-Tartrat negativ) bei Tieren. [**Incidence of S. paratyphi B in animals.**]—Zbl. Bakt. I. (Orig.) **180,** 304-309. [Summaries in English, French, Spanish and Russian.] **1709**

S. paratyphi B was isolated from a cow which had probably been infected by a human carrier. Methods of typing and differentiation from *S. java* were described.—E.G.

Trawińska, J. (1960). Przyżyciowe badanie serologiczne bitego żywca trzody chlewnej na nosicielstwo salmonel. [**Serological examination of slaughtered pigs for salmonella carriers.**]—Ann. Univ. M. Curie-Skłodowska Sect. DD **13,** 41-62. [In Polish. Summaries in English and Russian.] **1710**

Serological examination of blood samples from 450 slaughtered pigs, whose carcasses

passed meat inspection, gave titres of 1 : 320 to 1 : 1,280 with H. antigen of *S. dublin* (39), *S. cholerae-suis* (7), *S. typhi-murium* (5), *S. enteritidis jena* (4) and *S. typhi-suis* (3). Eight samples reacted positively with O antigens of *S. dublin* (2), *S. cholerae-suis* (1), *S. typhi-murium* (1) and *S. enteritidis jena* (4).

On bacteriological examination the following serotypes were isolated from 11 out of 450 gall bladders: *S. dublin* (5), *S. cholerae-suis* (2), *S. typhi-murium* (2) and *S. enteritidis jena* (1).—M. GITTER.

Staelens, M. (1960). Het voorkomen van Salmonellae in de mesenteriale lymfeklieren van varkens. **[Occurrence of salmonella in mesenteric lymph nodes of pigs.]**—Vlaams diergeneesk. Tijdschr. **29,** 359-371. [In Flemish. Summaries in English, French and German.] **1711**

S. examined bacteriologically lymph nodes of 1,007 pigs (957 normally slaughtered pigs and 50 emergency slaughterings). Only 2 positive results were obtained and 2 serotypes were isolated: *S. newington* and *S. dublin.* The contamination rate in Belgium was thus 0·19%, which was lower than rates reported from other countries.—R.M.

Smith, H. Williams. (1960). **The effect of feeding pigs on food naturally contaminated with salmonellae.**—J. Hyg., Camb. **58,** 381-389. [Author's summary modified.] **1712**

The author fed 20 salmonella-free pigs on food naturally contaminated with salmonella by fish meal and bone meal. The pigs were killed between 2 and 50 days later and their organs examined for salmonella.

None became ill and no lesions were found. Salmonella was found in very small numbers in the mesenteric lymph nodes of some but not in any internal organs or in muscle. The longer the pigs were fed on contaminated food the more likely were their mesenteric lymph nodes to be infected.

Salmonella was isolated from time to time from faeces but there was no evidence that the pigs became permanent faecal excretors.

Six pigs were kept for 8–20 days after the use of the contaminated food was discontinued. Salmonella was never found in their faeces and when they were killed only one had infected mesenteric lymph nodes. The results were discussed from the agricultural and public health aspects.

van der Schaaf, A. (1961). Salmonellose bij vleesetende huis- en pelsdieren. **[Salmonellosis in dogs, cats and fur animals.]** — Tijdschr. Diergeneesk. **86,** 99-110. [In Dutch. Summaries in English, French and German.] **1713**

During 1959 salmonella (*S. thompson, dublin, bovis-morbificans* and *typhi-murium*) were isolated from eight sick dogs, for which case-histories were presented. From two other cases *S. bareilly* and *paratyphi B* were isolated, and *S. bredeny* was isolated from a cat. The literature on salmonellosis in dogs, cats and fur animals was discussed.—R.M.

Trawiński, A. & Trawińska, J. (1960). Badania nad przenoszeniem salmonel przez muchy w stadiach rozwojowych. **[Transmission of Salmonella by flies and their larvae.]**—Ann. Univ. M. Curie-Skłodowska Sect. DD **13,** 31-40. [In Polish. Summaries in English and Russian.] **1714**

Of 250 flies, 250 larvae and 250 pupae which were infected with 5 *Salmonella* serotypes (*paratyphi B, dublin, typhi-murium, cholerae-suis,* and *enteritidis jena*), the organisms were recovered from 44·4% of flies, 20% of pupae and 20·8% of larvae. Another 250 flies were infected with the same serotypes which were subsequently recovered from their progeny (10·4% from larvae, 7·% from pupae and 6% from flies). Swine fever was transmitted to two pigs by inoculating them with larvae and pupae hatched from eggs of flies infected with the virus.—M. GITTER.

Moseley, B. E. B. & Gorrill, R. H. (1960). **An effect of early dilution on the establishment of lysogeny in Salmonella typhimurium.** — Nature, Lond. **188,** 755. **1715**

Dilution into broth or buffer of a culture of *S. typhi-murium* Strain LT2 soon after infection with phage P22 caused most of the cells to become lysogenic instead of lysing. The effect was at a maximum when dilution was made 6 min. after infection and decreased to a minimum at 12 min.—IAN DAVIDSON.

Compagnucci, M. (1960). Azione del lisozima sulla Salmonella pullorum. **[Action of lysozyme on Salmonella pullorum.]** — Zooprofilassi **15,** 959-980. [Summaries in English and French.] **1716**

Lysozyme had no inhibitory, bactericidal or lytic effect on *S. pullorum,* and only slightly affected its staining and morphological characteristics and respiration.—M.G.G.

Šerý, V. & Strauss, J. (1960). Ornitóza a salmonelóza u volně žijících ptáků v přírodní rezervaci a u drůbeže i lidí v nejbližším okolí. **[Psittacosis and salmonellosis in a bird sanctuary and in domestic poultry and man in the neighbourhood.]** — Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5,** 799-808. [In Czech. Summaries in German and Russian.] **1717**

The authors examined bacteriologically 188 ducks, 18 fowls, 28 pigeons, 177 black-headed gulls, 12 pheasants, 4 jackdaws, 3 collared turtle doves, 3 mallards and seven other species of wild birds. *Salmonella typhi-murium* and *S. london* were isolated from 13 of 188 ducks, from 10 of 25 of their eggs, from 72 of 177 gulls and from 5 of 100 of their eggs, and from 7% of the other species examined. Salmonella was also isolated from lake water in a sanctuary and from farm pond water, from the intestinal content of a carp and from 1 of 3 wood mice (*Apodemus sylvaticus*). Since psittacosis as well as salmonellosis had occurred in employees on nearby farms, sera of domestic and wild birds were examined for the presence of psittacosis antibodies. Antibody titres of 1 : 16 and over were demonstrated by indirect c.f. tests in 23 of 150 ducks, 10 of 20 pigeons, a dove, a jackdaw and a gull. Only two of 153 pigeons and 96 wild birds of various species yielded significant antibody titres, when examined by the direct c.f. test.—E.G.

Rosaschino, F. & Corsico, G. (1960). Contributo allo studio della mastite brucellare dei bovini. **[Brucella mastitis in cows.]**—Arch. Vet. Ital. **11,** 481-505. [Summaries in English, French and German.] **1718**

Clinical, serological and pathological studies of the udder and milk of 8 cows chronically excreting *Br. abortus* in the milk were made over periods of 1–4 years. In 19 of the 32 quarters brucella was demonstrable during life and P.M. and in 7 of them there was concomitant streptococcal infection. In all of the 12 quarters with pure brucella infection histological examination revealed an inflammatory process with epithelial changes associated with lympho-histioid infiltration. While clinical, physico-chemical and cytological examinations were of little or no diagnostic value serological and bacteriological tests revealed affected animals and quarters and the whey test was confirmatory at titres of 40 i.u. and over; lower titres were to be regarded as suspect.—T.E.G.R.

Dragonas, P. N. (1960). **[Brucellosis of animals in Greece.]**—Delt. Hellen. kten. Hetair. No. 40 pp. 145-160. [In Greek. Abst. from French summary.] **1719**

Brucellosis of cattle was reported for the first time in Greece in 1929 in imported animals. Between 1952 and 1960, 1,486 agglutination tests revealed that 28% of herds were infected, 16% doubtful and 56% free from brucellosis. Of 8,465 goats, 10% were positive, 9% doubtful and 81% negative. Of 1,013 sheep, 6% were positive, 6% doubtful and 88% negative.—M.G.G.

Ferguson, G. S. & Robertson, A. (1960). **Brucellosis in dairy herds—some applications of the milk ring test.**—J. Hyg., Camb. **58,** 473-484. [Authors' summary modified.] **1720**

Cows infected with brucellosis of the udder can usually be detected by an application of a modified milk ring test (MRT), based on the finding that milk samples from infected cows, in addition to showing a high bulk MRT titre also show considerable quarter variations. Cows recently inoculated with Strain 19 vaccine had low MRT titres in bulked samples, and quarter samples gave uniform results (except at the beginning and end of lactation and immediately following vaccinations), thus making differentiation between vaccinated and infected cows possible.

In a survey of raw milk samples from three areas in southern Scotland, 3·5, 5·3 and 9·0% of samples were shown to be infected with *Br. abortus.*

Jacob, K. (1960). Zur Pathologie des brucellenausscheidenden Rindereuters. II. Mitteilung. **[Pathology of the udder in cows excreting brucella. II.]** — Zbl. VetMed. **7,** 779-793. [Summaries in English, French and Spanish. For Part I see V.B. **29,** 3738.] **1721**

This deals with the supramammary lymph nodes of the same 25 brucella excretors mentioned in Part I of the paper. None of the macroscope lesions was specific for brucella infection. The typical histological picture was lymphadenitis of sometimes diffuse, sometimes granulomatous type accompanied by proliferation of reticulo-histiocytic cells, and leading to fibrous induration.—R.M.

I. Hellmann, E. & Hein, W. (1960). Untersuchungen an Rinderseren aus brucelloseverseuchten Beständen und Impfbeständen mittels der Serumlangsamagglutination und des Hitzetestes. **[Examination of serum samples from brucella infected and vaccinated**

herds by the slow agglutination test and a modification using heated serum-antigen mixtures.] — Dtsch. tierärztl. Wschr. **67**, 459-463. **1722**

II. Westphal, W. & Dickel, H. (1960). Über ergänzende Untersuchungsmethoden in der Serodiagnostik der Rinderbrucellose bei niedrigen Titern. Sind die bestehenden Bestimmungen abänderungsbedürftig? [**Supplementary serological methods in the diagnosis of brucellosis in cattle with low agglutination titres.**]—Ibid. 645-647. [Summaries in English.] **1723**

I. Sera from herds with brucellosis and herds immunized with Strain 19 were submitted both to the slow agglutination test and to the heat test, a modification of the agglutination test, in which the mixture of serum and antigen is heated to 65°C. for 18 min., cooled for 3 min. in cold water, and centrifuged at 2,000 r.p.m. for 3 min. The supernatant is poured away and replaced by physiological saline soln. A positive reaction is the appearance of flakes on shaking. Of 307 sera from herds with brucellosis, 263 were positive to the agglutination test and 270 to the heat test, but of 295 sera from immunized herds, 73 were positive to the agglutination test and only 13 to the heat test. The heat test titres were higher than the agglutination test titres in infected herds, but lower than the agglutination test titres in immunized herds. The authors stated that the test was modified from an unpublished test developed by Manthei and his colleagues at Beltsville, U.S.A.

II. The authors' modification of the heat-inactivation agglutination test differs from that described by Hellman & Hein. The mixture of serum and antigen was heated to 56°C. for 24 hours. Of 100 sera reacting to the ordinary agglutination test at low titre (1 : 20), 65 did not react to the heat-inactivation test. Another method that was tried was absorption of the serum with mixed bacterial antigens. Of 150 low-titre sera treated in this way, 83 no longer reacted to the agglutination test. It was recommended that regulations should be changed to permit the use of these methods. Dickel has also reported on this work in *Rindertuberk. u. Brucellose* **9**, 208–216 (1960). —M.G.G.

Teute, H.-W. (1960). Untersuchungen über die Entwicklung der Agglutinationstiter bei bangschutzgeimpften Kälbern. [**Development of agglutinin titres in calves inoculated with Strain 19 brucella vaccine.**]—Zbl. VetMed. **7**, 904-927. [Summaries in English, French and Spanish.] **1724**

Agglutination titres were observed for 4 years in calves, vaccinated with Strain 19 at the age of 5–9 months. During this period 6,831 blood samples were collected. At the age of 18 months 34·9% yielded doubtful and 20·1% positive, at 24 months 16·9% doubtful and 4·3% positive, and at 30 months 13·6% doubtful and 1·2% positive reactions. At 35 months there were no positive and at 41 no doubtful reactors. Positive reactions tend to disappear sooner in calves vaccinated at an early age than in cattle vaccinated later in life. —E.G.

Bürki, F. (1960). Die differential-diagnostische Beurteilung der Seren von tausend Problemkühen mittels der Komplementbindungsreaktion auf Brucellose. [**Differential-diagnostic evaluation of serum samples from 1000 cows of problem herds, by the complement-fixation reaction for brucellosis.**] — Berl. Münch. tierärztl. Wschr. **73**, 444-447. [Summary in English.] **1725**

In problem herds low positive agglutination titres may be due either to Strain 19 vaccination or to normal, agglutinins. Of 1,000 cows tested by the c.f. reaction, 921 were negative, 20 doubtful and 59 positive. In a brucellosis eradication scheme, cattle yielding positive c.f. reactions should be regarded as infected and culled, if more than one year has elapsed since vaccination. To what extent negative c.f. reactions may be taken as proof of absence of infection remains a problem. The percentage of infected animals yielding negative c.f. reactions is, however, so small that for practical purposes it may be disregarded.—E.G.

I. Börger, K. (1960). Weitere Versuche über die Wirksamkeit von Pecudin gegen eine Brucellen-Infektion. [**Efficacy of Pecudin against brucellosis.**]—Vet.-med. Nachr. No. 2. pp. 81-86. **1726**

II. Kauker, E. & Zettl, K. (1960). Beobachtungen über den Einsatz von Pecudin gegen die Brucellose des Rindes. [**Use of Pecudin in bovine brucellosis.**]—Ibid. pp. 87-97. **1727**

I. In a study on the effect of Pecudin in the prevention of abortion, 41 infected cows and 56 non-reactors were each given 10 g. of the drug daily for 30 days. Four of the infected cows and one of the non-reactors aborted. In untreated controls, six of 18

infected cows and one of 26 negative reactors aborted.

Daily oral doses of 4 mg./100 g. body wt., given for 30 days, protected 16 g.pigs against i/m infection with 37,000–370,000 brucella organisms. A temporary adverse effect on weight gains was noticed. Higher doses caused weight losses.

Milk from two groups each of two cows, treated for 10 days with 5 and 11 g. of Pecudin respectively, was normal in respect of smell and flavour. Substances inhibiting bacterial growth were not demonstrable in the milk.

II. Five reactor cows, 18 vaccinated with Strain 19, nine negative (three in advanced pregnancy), and 25 heifers, of a herd with a history of abortion, tolerated without adverse effects Pecudin food supplements amounting to 5 g. of active substance per animal per day for 3½–8 months. In advanced pregnancy the drug did not prevent abortion, when given over shorter periods. In heifers antibodies disappeared towards the end of the experimental period, others yielded negative serological reactions throughout the experiment. Excretion of brucella in milk and positive serological milk or blood tests were not influenced by Pecudin feeding.—E.G.

Gafni, M., Olitzki, A. L. & Ickowicz, M. (1960). **Spleen and liver reactions in young and adult mice in the course of experimental brucellae infection.**—Path. Microbiol., Basle **23**, 820-828. [Authors' summary modified.] **1728**

Two groups of mice, one 10 weeks old and the other 3 weeks old on the day of infection with *Br. abortus* Strain 19 were observed for 95 days. Changes in density of the bacterial population in spleen and liver and histological changes during the course of infection are described. Brucella persisted longer in the spleen in adult than in young mice. This difference was ascribed to the greater extent of red pulp in adults and its greater content of reticulo-endothelial cells.

Brambell, F. W. R., Halliday, R. & Hemmings, W. A. (1961). **Changes in ^{131}I-labelled immune bovine gamma-globulin during transmission to the circulation after oral administration to the young rat.** — Proc. roy. Soc. Ser. B. **153**, 477-489. **1729**

Labelled gamma-globulin reaches the circulation in substantial amounts although bacterial (*Brucella*) agglutinins from bovine *Br. abortus* immune serum appear to be completely excluded. When labelled gamma-globulin that has reached the circulation from the gut of the young rat is fed for a second time to another young rat it enters the circulation in relatively larger amounts. It appears that such passage effects a change in the gamma-globulin fed.—R.M.

Kessel, R. W. I., Aronson, M. & Braun, W. (1960). **Effects of brucellaphage on extracellular and intracellular Brucella abortus.**—Proc. Soc. exp. Biol., N.Y. **105**, 447-450. [Authors' summary modified.] **1730**

In studies on the interactions between brucellaphage and *Br. abortus,* either under extracellular conditions or after phagocytosis of the bacteria *in vitro* by g.pig mononuclear phagocytes, untreated or ultra-violet treated phage inhibited the multiplication of brucella, but heat-treated phage did not. These findings suggest an association between brucellacidal, or possibly brucellastatic, effects and phage protein. The effects on intracellular bacteria can occur even when exposure to phage is delayed until 2 hours after phagocytosis of the bacteria.

Strauch, D. (1960). Vergleichende Untersuchungen zur Verbesserung der serologischen Diagnostik der Schafbrucellose durch Verwendung eines Antigens aus Brucella melitensis für die Agglutinationsreaktion. **[Melitensis antigen for the agglutination test for brucellosis in sheep.]**—Berl. Münch. tierärztl. Wschr. **73**, 144-147. [Summary in English.] **1731**

The official brucella antigen of the German Federal Health Office does not contain *Br. melitensis* antigen, demonstrable with monospecific *Br. melitensis* serum. Agglutination reactions were carried out with 475 blood samples from sheep with natural *Br. melitensis* infection. The number of positive reactions obtained with a laboratory *Br. melitensis* antigen exceeded by 12% that obtained with the official antigen. The introduction of an official specific *Br. melitensis* antigen for sheep, in accordance with the International Unitage System, recommended by the FAO/WHO Expert Committee on Brucellosis, was advocated.—E.G.

Vukelić, A. & Bastalić, S. (1960). Primjena 15% otopine NaCl u seroaglutinaciji kod masovnog ispitivanja krvi ovaca na brucelozu. **[Use of 15% saline in mass serum agglutination tests for brucellosis in sheep.]**

—Vet. Glasn. **14**, 951-954. [In Croat. Summary in German.] **1732**

In routine agglutination tests for *Brucella melitensis* infection in serum samples from 11,118 sheep, a 0·85% soln. of saline was superior to a 15% soln., the number of reactors being 119 and 69, respectively.—E.G.

Rementsova, M. M. & Levit, A. V. (1960). **[Brucellosis in Tibetan hares in Kazakhstan.]** —Trudy Inst. Zool. Akad. Nauk Kazakh. SSR **12**, 57-63. [In Russian.] **1733**

The authors collected 340 *Lepus tibetanus* killed during two winter months in part of the Alma-Ata oblast. Suspensions of organs were inoculated into chick embryos or into mice. Three strains of brucella were isolated from the embryos and two from the mice. All cultures had the properties of *Br. melitensis*. The authors suggested that the organisms originated from sheep grazing in the same district.—R.M.

Zhurnakova, M. A. (1961). **[Detection of brucella in water, soil, hay and other inanimate objects by means of the complement fixation test.]**—Veterinariya, Moscow No. 1 pp. 75-77. [In Russian.] **1734**

Antiserum for the test was obtained from cattle or rabbits hyperimmunized with an antigen prepared from 4 strains of brucella; details are given. Antigen consisted of aqueous extracts of the objects under test. For experimental purposes, heat-killed brucella were added to water, soil or hay. In addition leaves and paper were exposed to aerosols of killed brucella. No materials from infected premises were examined. The test was fully positive at a titre of 1 : 160 when one million or more organisms were present in the antigen preparation.—R.M.

Gdovin, T. (1960). Niektoré pozorovania o vzťahu orchoepididymitíd baranov k plodnosti a úlohe oviec pri prenose infekčnej epididymitídy. **[Relationship between orchitis-epididymitis in rams and fertility in ewes.]**—Folia vet., Košice **4**, 163-170. [In Slovak. Summaries in English, German and Russian.] **1735**

From fertility tests in rams with orchitis-epididymitis, attributed to *Brucella ovis* infection [*V.B.* **30,** 1772], it appeared that unilateral infection reduced fertility by about 15%, bilateral infection by 25%. About one-third of ewes served by infected rams developed mucopurulent vaginal discharge. About 16% of lambs died before reaching 6 weeks of age. Two of six male lambs, slaughtered at 6 months had orchitis-epididymitis. A healthy ram serving an infected ewe became infected.—E.G.

Gamčík, P. (1960). Klinické štúdium epididymitíd baranov s osobitným zretel'om na spermiogram. I. Časť: Klinický obraz a diagnostika epididymitíd baranov. II. Časť: Spermiogram baranov s epididymitídami. **[Clinical study of epididymitis in rams with special reference to semen.]** — Folia vet., Košice **4**, 171-190 & 191-207. [In Slovak. Summaries in English, German and Russian.] **1736**

Bogdan, J. (1960). Príspevok k otázke etiopatogenézy uzlov chvosta prisemenníkov baranov. **[Aetiology and pathogenesis of nodular epididymal lesions in rams.]**—Folia vet., Košice **4**, 209-223. [In Slovak. Summaries in English, German and Russian.] **1737**

Clinical epididymitis was present in 354 of 3,860 stud rams examined during 1956–58; less than half were affected unilaterally. The ratio between infection of the left and right was about 7 : 3. The tail of the epididymis was affected in 74%, the body in 14% and the head in 11%. The acute form appeared between 10–20 days after infection and was characterized by painful swelling of testicles and epididymis, increase in temperature and reduction or absence of libido. About 95% of affected rams seen had the chronic form of the disease, which in the initial stages is difficult to diagnose. Calcified foci were demonstrated radiologically in the testicle and epididymis before they became palpable. All samples of preputial washings contained staphylococci, 66% lactobacilli, 55% *E. coli* and *Mycobact. smegmatis* and 22% pasteurella and enterococci. A brucella was isolated from 44% and *Corynebact. pyogenes* from 22% of testicular biopsy samples. *C. pyogenes* was isolated P.M. from 44% of slaughtered rams. Experimental infection of rams with suspensions of biopsy material failed.

Concentration of spermatozoa in samples taken during the acute stage was low, 60–62% were dead, and 25–42% deformed. Semen quality improved slightly after 10–12 days. Ejaculates from rams with chronic epididymitis were of low quality, contained flakes of pus and pathogenic bacteria such as brucella, corynebacteria, pseudomonas and *E. coli*. Sixty-one of 78 ewes served by rams with unilateral epididymitis became pregnant, but only 34 of 76 served by rams in which

both testicles were affected. For comparison 92 healthy ewes were served by healthy rams and 85 became pregnant.

In 132 experimentally infected rams clinical diagnosis of epididymitis was confirmed histologically in 72, of orchitis in 52 and of periorchitis in 88. Of 168 spontaneously infected rams epididymitis was present in 133, orchitis in 98 and periorchitis in 141. Brucella organisms were isolated from 17·7% of epididymal nodular lesions of spontaneously infected rams, *Corynebacterium ovis* from 12·5%, *C. pyogenes* from 11·8%, *Escherichia coli* from 10·62%, pasteurella organisms from 2·3%, *Streptococcus viridans* from 1·18%, *Staphylococcus pyogenes* and *Pseudomonas pyocyanea* from 0·59%.—E.G.

Yager, R. H., Spertzel, R. O., Jaeger, R. F. & Tigertt, W. D. (1960). **Domestic fowl—source of high titer P. tularensis serum for the fluorescent antibody technic.**—Proc. Soc. exp. Biol., N.Y. **105**, 651-654. [Authors' summary modified.] **1738**

Fowls immunized with living *Brucella tularensis* produced a more specific serum with a higher working dilution than rabbit or monkey serum. The suspending medium did not affect the degree or intensity of specific staining or working dilution of the serum. Cross-reactions suggest a specific antigenic relationship between *Br. tularensis* and the *Pseudomonas* used in this study. This cross-reaction was eliminated by specific adsorption with heterologous living organisms.

Farina, R. & Sobrero, L. (1960). Ricerche sierologiche sulla diffusione delle leptospirosi animali in Somalia. **[Serological survey for leptospirosis in cattle, goats and camels in Somalia.]**—Zooprofilassi **15**, 925-936. [Summaries in English and French.] **1739**

In Somalia, 241 (71%) of 340 slaughter cattle, 11 of 86 goats, and 11 of 61 camels were positive serologically for one or more of 10 leptospiral serotypes (*grippo-typhosa, sejroe-saxkoebing, hyos, bataviae, icterohaemorrhagiae, ballum, pomona, australis A, canicola* and *zanoni*).—M.G.G.

Bürki, F. & Gisep, C. (1961). Leptospirosis pomona auf einem Bauerngehöft mit gemischtem Viehbestand. **[Leptospira pomona infection on a farm with mixed livestock.]**—Schweiz. Arch. Tierheilk. **103**, 63-72. [Summaries in English, French and Italian.] **1740**

A cow that aborted in the 7th month of pregnancy was negative for brucellosis, but had a high c.f. titre for leptospirosis. The other 18 cattle in the herd were serologically negative for leptospirosis, but the 2 horses and many of the pigs were positive. Investigation of the premises revealed that urine from the pigsties was able to reach the stable of the 2 horses and the byre of some of the cattle.

—M.G.G.

Rhodes, L. J. L. (1960). **An immunological study of leptospirosis pomona.**—Aust. vet. J. **36**, 419-426. **1741**

R. described the production and experimental use of a vaccine prepared from *Leptospira pomona*. A single dose of vaccine protected calves against an i/p injection of *L. pomona* freshly recovered from guinea-pigs and grown in semi-solid media. The controls (9 animals) showed fever, depression, anorexia and weight loss, while the vaccinates (16 animals) remained lively and continued to eat well. The serum titres after vaccination and after challenge are recorded.

Leptospires were recovered from the urine of only one animal (a control) and there is still doubt as to whether vaccinated animals might become carriers after subclinical infection.

Media for the cultivation of leptospires are discussed.—N. Wickham.

Kushnerov, T. N. (1961). **[Haemosporidin for treatment and prophylaxis of leptospirosis in calves.]**—Veterinariya, Moscow No. 1 pp. 51-52. [In Russian.] **1742**

Haemosporidin is used for the treatment of piroplasmosis in the Soviet Union [*V.B.* **27**, 437]. K. injected it for prophylactic purposes into 1,178 calves on farms where losses from leptospirosis had been experienced. It was claimed that no fresh cases occurred after all calves on a given premises were injected. Dosage was 1 mg./kg. body wt. subcutaneously in 8–10 ml of water.—R.M.

Kolochine-Erber, B. & Mailloux, M. (1960). Les leptospiroses du porc en France; et leurs conséquences en médecine humaine. **[Leptospirosis in pigs in France in relation to human infection.]**—Zbl. Bakt. I. (Orig.) **180**, 371-379. [In French. Summaries in English, German, Spanish and Russian.] **1743**

In France *L. pomona* infection was diagnosed serologically in 132 patients between 1950 and 1959. The geographical distribution of the cases corresponded to the incidence of leptospirosis in pigs. The information on leptospirosis in pigs in France has already been published [see *V.B.* **31**, 650].—M.G.G.

Kolochine-Erber, B. & Mailloux, M. (1961). Les leptospiroses humaines à L. pomona et L. mitis Johnson 1942 (maladie des porchers). **[Human leptospirosis due to L. pomona and L. mitis of porcine origin in France.]**—Ann. Inst. Pasteur **100**, 53-70. [Summary in English.] **1744**

The geographical incidence of Swineherd's disease in France was defined. Between 1945 and 1960 *L. pomona* was isolated at the Pasteur Institute from 143 human beings; *L. mitis* was rarer.—R.M.

Tarkiewicz, S. & Krakowiak, T. (1960). **Studies on the intradermo-allergic test in the diagnosis of canine leptospirosis by means of PK leptospirin.** — Ann. Univ. M. Curie-Skłodowska Sect. DD **13**, 291-303. [In English. Summaries in Polish and Russian.] **1745**

For the preparation of the allergen, 12 to 16-day cultures of *L. canicola, L. icterohaemorrhagiae* and *L. grippo-typhosa,* grown at 27°C. in Korthof's medium were used. The cultures were then centrifuged, resuspended in Korthof's solution, subjected to ultrasonic vibration and inactivated in a water bath at 56°C. for 30 min.; 0·5% of phenol was added as preservative. Thirty-one dogs were tested and the maximum reaction was seen at 24 hours; 7 dogs which reacted positively also gave a positive reaction to the serum agglutination test.

Experiments performed simultaneously with allergens prepared from the three leptospiral serotypes showed that the test is not specific for particular serotypes.—M. Gitter.

Packchanian, A. (1960). **Chemotherapy of Borrelia anserina infection (spirochetosis) in chicks with amphomycin, kanamycin, telomycin and tetracycline.**—Antibiot. & Chemother. **10**, 731-739. [Summary in Spanish p. 776. Author's summary modified.] **1746**

Four antibiotics, sodium amphomycin, kanamycin sulphate, telomycin, and tetracycline hydrochloride, were tested against fatal avian spirochaetosis in chicks. Each, when administered intramuscularly in adequate dosage levels, was curative. *B. anserina* in defibrinated chick blood stored at −20°C. remained viable and virulent for more than one year. This new procedure for maintaining *B. anserina* is reliable and satisfactory.

Kaszubkiewicz, C., Sobiech, T. & Wachnik, Z. (1960). Uwagi na temat rozpoznawania i zwalczania enterotoksemii owiec. **[Diagnosis and control of enterotoxaemia in sheep.]**—Med. Wet., Warszawa **16**, 716-719. [In Polish. Summaries in English, French, German and Russian.] **1747**

In two outbreaks, 30 of 386 ewes and 8 of 80 lambs aged 2–3 weeks died and P.M. examination revealed pulpy kidneys, jelly-like clots in pericardial sacs, thickening of the wall of the ileum, caused by hyperplasia of the lymphatic tissues, and marked thickening of the pleura. *Cl. welchii* was isolated from the internal organs of affected ewes and lambs; g.pigs inoculated s/c with suspension of ground lambs' kidneys and intestine died within 24 hours. [The number of g.pigs used is not mentioned and no attempt at typing the organism is described.] After cutting down the concentrate ration and administration of penicillin, 150,000 i.u. per animal daily for 4 days, the losses stopped.—M. Gitter.

Verwoerd, D. W. (1960). Isolasie van die protoksien van Clostridium welchii tipe D. **[Isolation of the prototoxin of Clostridium welchii Type D.]**—J. S. Afr. vet. med. Ass. **31**, 195-203. [In Afrikaans. English summary modified.] **1748**

A method is described for isolation of purified epsilon-prototoxin of *Cl. welchii* Type D. Precipitation with methanol at −5°C. was used to prepare a crude extract from a culture grown on a synthetic medium. After freeze-drying, this was further purified by the same method. Antigenic analysis by gel diffusion as well as titrations in mice were used as criteria of purity. Comparable results were obtained in three experiments, preparations showing only one antigen-precipitation line, and containing $2{\cdot}2–5{\cdot}0 \times 10^6$ MLD/mg.N, being obtained. Crystallization of one preparation occurred on storage for ten days at −20°C. after addition of 35% methanol, but lack of material prevented identification.

Katitch, R., Pouhatch, I., Voukitchevitch, Z., Mekouli, E. & Marintchevitch, S. (1960). Contribution à la connaissance de la protection simultanée des moutons contre quelques affections à anaérobies et parasitaires. **[Protection of sheep against "black disease" by simultaneous use of vaccines and anthelmintics.]** — Bull. Off. int. Epiz. **54**, May pp. 482-487. **1749**

Results of experiments indicate that the simultaneous treatment of sheep against *Clostridium welchii,* Types C and D, and *Cl. oedematiens* (with a polyvalent vaccine) and against helminths (with CCl_4 and pheno-

thiazine) is efficacious, has no untoward effects and is easier and cheaper than separate treatment of the respective diseases.—T.E.G.R.

Sterne, M. & Batty, I. (1961). **Toxoiding with beta-propiolactone.**—J. Path. Bact. **81**, 239-244. [Authors' summary modified.] **1750**

The authors confirmed that the β-toxin of *Clostridium welchii* Type B can be toxoided with β-propiolactone.

But even 5% β-propiolactone could not be relied on to toxoid Type-B cultures sufficiently for them to pass statutory non-toxicity tests; this and lower concentrations (1%) caused considerable destruction of antigen.

Lactone-toxoids, despite their residual toxicity, were less efficient than formol-toxoids in eliciting immunity. The keeping quality of a lactone-toxoid appeared to be inferior to that of a formol-toxoid.

Bisbini, P. (1960). Ulteriori ricerche sul metodo di identificazione "in vitro" del bacillo tetanico. I.—Interferenza della concentrazione idrogenionica. **[Identification of Clostridium tetani. I. Effect of hydrogen-ion concentration.]**—Boll. Ist. sieroter., Milano **39**, 561-569. [Summary in English.] **1751**

Bisbini, P. & Zanetti, M. (1960). Ulteriori ricerche sul metodo di identificazione "in vitro" del bacillo tetanico. II.—Proposta di un terreno tamponato. **[Identification of Clostridium tetani. II. Use of a buffered medium.]** — Ibid. 571-575. [Summary in English.] **1752**

I. Growth of *Clostridium tetani* did not occur at a pH higher than 5·4–5·2. In liquid media, such as liver broth for anaerobic organisms, multiplication was hindered by other spore-forming bacteria (*Cl. tertium* and *Cl. bifermentans*) which acidified the medium to pH 5 while *Cl. tetani* was still in its developmental phase.

II. It is suggested that the liver broth medium for anaerobes (with ferrous sulphate and cysteine added for the identification of *Cl. tetani*) should be buffered with a saline solution capable of maintaining the original pH unchanged for at least 15 days. Such a medium it is considered, would facilitate the demonstration and identification of the organism even when it is in mixed culture with other spore forming anerobes, especially *Cl. tertium* and *bifermentans*.—T.E.G.R.

Prati, G., Mondini, S. & Gioia, V. (1960). Sull'antitossina tetanica di origine transplacentare. **[Transplacental transfer of tetanus antitoxin.]**—Nuova Vet. **36**, 267-272. [Summaries in English and French.] **1753**

Tetanus antitoxin was demonstrable in the serum of 6 foals born to vaccinated mares which were given a booster dose during pregnancy and was considered to have crossed the placenta, probably bound to the serum protein fractions with low molecular weight. —T.E.G.R.

Leaver, D. D. & Hart, I. H. (1960). **Observations on the distribution and control of bovine vibriosis in Victoria.**—Aust. vet. J. **36**, 460-465. **1754**

During 1958 vibriosis was diagnosed in 40% of the infertility problem herds and was present in all the major dairying districts of Victoria. Methods of husbandry and interchange and disposal of bulls favoured the spread of infection. Control methods were investigated in 30 herds at the acute and chronic stages of the disease. At the acute stage treatment plus artificial insemination would not be economic under present conditions. It is recommended that the herd be split into exposed and not exposed, and that a virgin bull be used with the non-exposed cows. In the exposed group each cow should be served once at each oestrus. In the chronic stage A.I. is the method of choice but is only available in a limited number of areas. The two herd system using natural service, advised in other countries, did not prove practicable. Some success was obtained with a modified system of control. The authors state that there is need to investigate further the importance of the carrier cow.

—W. L. Hindmarsh.

Newsam, I. D. B. (1960). **Experimental Vibrio fetus infection in heifers. Part I. Infection and conception rates, and diagnosis.**—Aust. vet. J. **36**, 426-431. **1755**

Four infected bulls were mated with groups of normal heifers, the four groups having no contact with each other. Records were kept of observed mating, pregnancy and vibrio infection. Vaginal mucus samples were collected each week for cultural and agglutination tests. Results of the mating of 106 heifers in the four groups are tabulated. The average conception rate to first service was 40%; 61 heifers developed vibriosis and of these 13 became pregnant; 45 heifers did not contract vibriosis and of these 30 became pregnant. The authors conclude that the

vaginal mucus agglutination test is of satisfactory specificity and useful for herd diagnosis of vibriosis.—W. L. HINDMARSH.

Tustin, R. C., Adelaar, T. F. & Cameron, C. (1960). **An outbreak of bacterial icterus in sheep.** — J. S. Afr. vet. med. Ass. **31**, 275-283. **1756**

Over 100 sheep in a flock of 300 died in 2 weeks with icterus and pneumonia. Photosensitization was seen in 10% of the affected animals. P.M. examination revealed generalized icterus, pneumonia, pleuritis, and focal necrosis of the liver. The lungs of 2 sheep yielded pure cultures of an unidentified Gram-negative bacterium that grew best on blood agar at 37°C. S/c inoculation of experimental sheep resulted in acute septicaemia or a more protracted illness with liver damage and icterus. The organism was re-isolated from the lymph nodes of one with clinical icterus, and lab. animals died from an acute infection after receiving organ material from another. The bacterium was pathogenic for mice, g.pigs and rabbits.—M.G.G.

Bouvier, G. (1960). Transmission possible de la tuberculose et de la brucellose du gibier à l'homme et aux animaux domestiques et sauvages. **[Transmission of tuberculosis and brucellosis from wild animals to man and to domestic and wild animals.]** — Nuova Vet. **36**, 185-188. [In French. Summaries in English, German, Italian and Spanish.] **1757**

Tuberculosis was diagnosed P.M. in 1 of 384 chamois; 11 of 892 roe-deer; 5 of 27 badgers. It was also diagnosed in 2 deer, 4 swans, 2 coots, 1 crane, 1 missel-thrush, 4 wood-pigeons, and in 2 partridges and 3 pheasants reared in captivity. The role of these animals and birds in the spread of the disease to domestic animals (especially cattle) and birds is discussed. Brucellosis is frequent in hares in Switzerland; it is due to *Br. suis*, and constitutes a real danger to man and to domestic and wild animals.—T.E.G.R.

Geyer, S. (1961). Erfahrungen mit der Behandlung der Mikrosporie der Katzen mit Griseofulvin. **[Griseofulvin in Microsporum infection of cats.]**—Kleintier-Praxis **6**, 18-22. [Summaries in English and French.] **1758**

As shearing and a daily oral dose of 15 mg. of griseofulvin per kg. body wt. for 3 weeks failed to eradicate *M. canis* infection in 2 Angora cats, the animals were shorn again and the dose was increased to 30 mg./kg. daily for 4 weeks. At the end of this period only the tips of the hairs of one cat yielded *M. canis*. This cat was shorn again, and was subsequently negative.—M.G.G.

Manktelow, B. W. & Russell, R. R. (1960). **Human ringworm associated with Trichophyton mentagrophytes infection in guinea pigs.**—N. Z. med. J. **59**, 488-489. **1759**

T. mentagrophytes was isolated from 31 of 32 g.pigs with ringworm lesions, and from four without lesions. It was also isolated from 3 of 4 laboratory personnel who had handled these animals. Control of the condition in laboratory stock was discussed. —E.G.

van der Gulden, W. J. I. & Zuur, P. J. (1961). Long- en darmmycose bij paarden als mogelijke complicatie bij antibioticatherapieën. **[Pulmonary and intestinal mycosis in horses as a possible complication following antibiotic therapy.]**—Tijdschr. Diergeneesk. **86**, 85-98. [In Dutch. Summaries in English, French and German.] **1760**

Within 9 months two cases of intestinal mycosis associated with *Absidia ramosa*, *Mucor pusillus* and *Aspergillus fumigatus* and one case of mycotic pneumonia associated with *A. fumigatus* were diagnosed P.M. at Utrecht. The mycotic lesions appeared to be recent and were regarded as the result of secondary infections. These horses died between 2 and 6 weeks after commencement of therapy with penicillin or streptomycin for acute septic processes (leg wound, puerperal fever and infected throat). There are 6 photographs of lesions.—R.M.

Gracey, J. F. & Baxter, J. T. (1961). **Generalized Aspergillus fumigatus infection in a lamb.**—Brit. vet. J. **117**, 11-14. [Authors' summary.] **1761**

A case of generalized mycosis due to *Aspergillus fumigatus* in a two-month-old lamb is described. Both the vascular and lymphatic systems appeared to be involved in the extension of the infection from the respiratory system to other organs in the body.

Moreau, C. & Moreau, M. (1960). Un danger pour le bétail nourri de plantules fourragères cultivées en germoirs: la pullulation d'une moisissure toxique, l'Aspergillus clavatus, cause des accidents mortels. **[A danger for cattle fed on forage seedlings grown in germinators: the rapid growth of a lethal mould, A. clavatus.]** — C. R. Acad. Agric. Fr. **46**, 441-445. **1762**

A herd of cows whose ration included

sprouted wheat developed slight fever, incoordination of movement, extreme nervousness, inappetence, paralysis of the forestomachs, constipation and arched back. Several died. A prolific growth of *A. clavatus* was found on the sprouted wheat, the development of which was not affected by the fungus.—M.G.G.

Englert, H. K. (1961). Gesäugeaktinomykose beim Schwein. [**Mammary actinomycosis in sows.**]—Dtsch. tierärztl. Wschr. **68,** 110-113. [Summary in English.] **1763**

Incidence of mammary "actinomycosis" in sows slaughtered at Freiburg was 4–6%. Bacteriological examination of 100 cases revealed massive mixed infections, but pure cultures of corynebacteria were isolated from 37 (27 of which were *C. pyogenes*) and pure cultures of actinomycetes from 26. E. regarded a characteristic micro-aerophilic actinomycete (named *A. suis*) as the primary cause of the disease. He believed that infection entered the udder through bite wounds made by piglets, and not from the bedding because the actinomycete soon died outside the pig. In one piggery there appeared to be an inherited predisposition.—E.G.

Tsubura, E. & Schwarz, J. (1960). **Treatment of experimental sporotrichosis in mice with griseofulvin and amphotericin B.**—Antibiot. & Chemother. **10,** 753-757. [Summary in Spanish pp. 778-779. Authors' summary modified.] **1764**

Griseofulvin administered orally in five concentrations (from 25 to 200 mg./kg./day) did not influence the lethal course, cultural, or microscopic findings in mice intravenously infected with *S. schencki.*

Amphotericin B given intraperitoneally (1 mg./kg.) for 14 days decreased the mortality by one-fifth and prolonged survival time.

Amphotericin B given at 10 mg./kg. for 14 days decreased mortality by about 75%, sterilized most organs, and gave normal appearance to the tissue sections. There was some drug toxicity at this dosage.

El Nasri, M. (1960). **Further observations on the stability of freeze dried vaccine against contagious bovine pleuropneumonia.**—Sudan J. vet. Sci. anim. Husb. **1,** 69-71. [Author's summary modified.] **1765**

Freeze-dried vaccine against bovine contagious pleuropneumonia can be stored in an ice-chest for 3 years without detectable loss in titre and can protect animals against challenge. Vaccine stored in the incubator at 37°C. showed a drop in titre and immunizing power.

There is evidence that cattle can tolerate forty times the recommended dose.

Rodwell, A. W. (1961). **Unbalanced growth of Mycoplasma mycoides caused by glycerol deficiency.**—Nature, Lond. **189,** 125. **1766**

Glycerol, required by *M. mycoides* as an essential nutrient, is rapidly oxidized by cell suspensions, probably by a flavoprotein-catalysed oxidation of α-glycerophosphate. Glycerol deficiency was found to cause unbalanced growth and observation of morphological changes in the cells suggested that glycerol may be needed for the synthesis of some surface structure and that this synthesis is more sensitive to glycerol deficiency than is the synthesis of the cytoplasm. The greater requirement for glycerol under aerobic conditions is due to the greater rate of oxidation and loss of glycerophosphate for purposes of synthesis.—E.V.L.

Barnes, L. E., Ose, E. E. & Gossett, F. O. (1960). **Treatment of experimental PPLO infections in young chickens with tylosin, a new antibiotic.** — Poult. Sci. **39,** 1376-1381. [Authors' conclusions modified.] **1767**

Tylosin controlled experimental PPLO infections of chicks when given in the drinking water at 3 g. per gal. for 7 days, when administered as a dust inhalant at 50 mg. per sq. ft. of floor space 3 times at 24-hour intervals, or when injected once parenterally at 5 mg. per lb. of body wt., as determined by weight gain, serology, occurrence of lesions and cultural isolation of PPLO.

Köhler, H. (1960). Das histo-pathologische Bild des Respirationstraktus bei chronischer Atemkrankheit und infektiöser Bronchitis der Hühner. [**Histopathology of chronic respiratory disease and infectious bronchitis in fowls.**] — Dtsch. tierärztl. Wschr. **67,** 665-670. [Summary in English.] **1768**

Histological lesions in chronic respiratory disease include giant cell miliary granuloma in lungs, tertiary bronchi and alveoli, with histiocyte, plasma cell and lymphocyte infiltration of the tracheal submucosa and epithelial hyperplasia. Bronchial lesions are similar. Catarrhal bronchopneumonia is not a characteristic feature. There is acute fibrinous inflammation of the air-sacs.

Infectious bronchitis is characterized by tracheal hyperaemia and oedema with epithelial desquamation, bronchial hyperaemia and collagenous degeneration of the bronchial submucosa. Lung and nasal lesions are not regarded as characteristic.—E.G.

See also absts. **1931** (interstitial pneumonia in fowls); **2019** (cystic ovarian degeneration and genital flora in cows); **2023** (standard culture medium); **2027** (Mackie & McCartney's handbook of bacteriology); **2028** (book, brucellosis); **2029** (dictionary of the fungi).

DISEASES CAUSED BY PROTOZOAN PARASITES

Uilenberg, G. (1961). **Dourine probably occurring in the Sudan.** — Tijdschr. Diergeneesk. **86,** 130-133. [In English. Summaries in French, German and Dutch.] **1769**

Trypanosomes resembling *T. equiperdum* were found in fluid aspirated from the swollen vulva of a donkey mare. They were also found in the muco-purulent vaginal discharge. U. suggested that, although dourine has not been reported from the Sudan before, it might have been present but undetected for a long time.—R.M.

Ray, H. N. & Malhotra, M. N. (1960). **Akinetoplastic strain of Trypanosoma evansi produced by 'Prothidium'.** — Nature, Lond. **188,** 870. **1770**

In rats with *Trypanosoma evansi* in the peripheral circulation, Prothidium caused rapid disappearance of the kinetoplast and some change in the functional activity of the protozoon, which is now in its eighth passage. —T.E.G.R.

Bennett, G. F. (1961). **On the specificity and transmission of some avian trypanosomes.**—Canad. J. Zool. **39,** 17-33. [Author's abst. modified.] **1771**

Trypanosomes, from different species of birds from Algonquin Park, Ontario, multiplied and produced infective states in ornithophilic simuliids. Using these insects and *Aedes aegypti* as intermediate hosts, trypanosomes from one bird were transmitted to other birds, indicating that the parasites had little host specificity. Development of flagellates in other kinds of biting Diptera was not consistent. Experiments indicated that the parasite was probably transmitted by the penetration of flagellates (in faeces of infected flies) through breaks in the host's skin.

Farr, M. M. (1961). **Further observations on survival of the protozoan parasite, Histomonas meleagridis, and eggs of poultry nematodes in feces of infected birds.**—Cornell Vet. **51,** 3-13. **1772**

Faeces of infected chickens and turkeys were distributed on outdoor plots of well-drained loamy soil, and samples of faeces and soil from the plots were fed to turkey poults up to 299 weeks later. *Histomonas meleagridis* survived for 151 weeks, *Heterakis gallinarum* for 230 weeks, *Ascaridia* for 161 weeks, *Capillaria obsignata* for 103 weeks, and *Syngamus trachea* for 31 weeks. [The author stated that she had used the wrong nomenclature for two worms in her previous paper (see *V.B.* **26,** 3430) : accordingly in that abst., for *Heterakis gallinae* read *Heterakis gallinarum,* and for *Capillaria dujardini* read *Capillaria obsignata.*]—M.G.G.

Stephens, J. F. & Tugwell, R. L. (1960). **Sources and levels of vitamin K in relation to cecal coccidiosis.** — Poult. Sci. **39,** 1183-1187. **1773**

High mortality and prolongation of the blood clotting time in chicks infected with *Eimeria tenella* and fed a ration poor in vitamin K were prevented by adding to the ration menaphthone sodium bisulphite (0·36–9·72 g. per ton), 2·5% or 5% hydrolysed poultry litter, 2·5% faeces of chicks fed a diet supplemented with vitamin K, or 3% lucerne meal, but not by 3% menhaden fish meal. Addition of 2·5% faeces from chickens fed a diet poor in vitamin K reduced blood clotting time but not mortality.—M.G.G.

Miklovich, N. & Pellérdy, L. (1960). **Comparative investigations into the coccidiostatic effect of various sulphonamides.**—Acta vet. Acad. Sci. hung. **10,** 383-387. [In English.] **1774**

In 125 rabbits, four weeks old, experimentally infected with *Eimeria stiedae* oocysts, sulphapyrimidine, sulphaquinoxaline and sulphamethylthiazole were superior to sulphathiazole and succinylsulphathiazole. Sulphaguanidine, sulphacetylamide and sulphafurazole were even less effective and sulphathio-carbamide ineffective against rabbit coccidiosis.—E.G.

McLoughlin, D. K., Gardiner, J. L. & Chester, D. K. (1960). **The activity of glycarbylamide, trithiadol, and nicarbazin against Eimeria**

tenella in chickens. — Poult. Sci. **39,** 1328-1332. [Authors' summary modified.] **1775**

Glycarbylamide, Trithiadol, and nicarbazin were all effective as prophylactics for caecal coccidiosis. Nicarbazin was the most efficacious in controlling morbidity and mortality. Birds fed glycarbylamide made better weight gains and had more efficient feed conversion than groups fed other drugs.

Some infected, medicated birds made better weight gains than uninfected, medicated controls. Attempts to demonstrate that this was associated with the severity of the infection were unsuccessful.

Hymas, T. A. & Stevenson, G. T. (1960). **A study of the action of Zoalene on Eimeria tenella and Eimeria necatrix when administered in the diet or in the drinking water.**—Poult. Sci. **39,** 1261-1262. **1776**

Chicks were infected with oocysts of *E. tenella* or *E. necatrix*. Treatment began 48 hours later with 0·0125% Zoalene [see *V.B.* **30,** 2852] in the food for 48 hours, or began 60 hours after infection with 0·015% Zoalene in the drinking water for 36 hours. Both treatments completely controlled the infections.—M.G.G.

White-Stevens, R. H., Zeibel, H. G. & Stokstad, E. L. R. (1960). **Interrelation of dietary chlortetracycline and coccidiostatic drugs on the growth efficiency of broilers.**—Poult. Sci. **39,** 1305-1306. **1777**

The effect of the following food supplements on weight gain and mortality of 25,000 broilers was studied: chlortetracycline at 50, 100 or 200 g. per ton, nitrophenide at 0·025%; sulphaquinoxaline at 0·0185%; nitrofurazone at 0·0055%; and "Coccivac". Chlortetracycline (100 g./ton) and nitrophenide appeared to have a synergic effect on weight gain.—M.G.G.

Holz, J. (1960). Über Piroplasmosen in Indonesien. **[Piroplasmosis in cattle in Indonesia.]**—Berl. Münch. tierärztl. Wschr. **73,** 448-451. [Summary in English.] **1778**

Among native cattle acute outbreaks are rare. Chemotherapeutics were recommended mainly for use in newly imported cattle. The principal causal agents in cattle and buffaloes were *Babesia bovis* (99%) and *B. bigemina* (1%).—E.G.

Dimopoullos, G. T. & Bedell, D. M. (1960). **Studies of bovine erythrocytes in anaplasmosis. I. Flocculating properties of stromata in water.**—Proc. Soc. exp. Biol., N.Y. **105,** 463-466. [Authors' summary modified.] **1779**

Differences in flocculating characteristics of the stroma of r.b.c. from uninfected calves and calves infected with *Anaplasma marginale* are described; they are attributed to a change in isoelectric point due to altered total phospholipid content.

Satô, N. (1960). **Studies on the distribution of dye-test antibodies among animals in Hokkaido and on the complement fixing antigen for toxoplasmosis.**—Jap. J. vet. Res. **8,** 217-218. [In English.] **1780**

Antibodies to the dye test were demonstrated in 44% of 52 sheep, 27·5% of 69 dogs, 25% of 580 cattle, 18% of 165 pigs, 15% of 40 guinea-pigs, 2 of 105 horses, but none of 42 fowls. Six pigs, 2 dogs and a sheep had titres of 1 : 1,024 or more. The results of the c.f. test in experimentally infected animals, using antigens extracted from chorio-allantoic membrane, mouse peritoneal fluid and tissue culture fluid paralleled those of the dye test. —M.G.G.

Nardi, E. (1960). La balantidiosi nei suini e nei bovini del comune di Foggia. **[Balantidium coli infection of pigs and cattle in Foggia, Italy.]** — Vet. ital. **11,** 868-873. [Summaries in English, French and German.] **1781**

An account is given of 2 outbreaks of *Balantidium coli* infection in 4 of 80 pigs and in 3 cattle. Phenothiazine effected a slow cure. The organism was demonstrable in faeces samples from 151 slaughtered pigs in the district.—T.E.G.R.

Appasov, R. N. (1960). **[Intestinal parasites of man and pig in the Alma-Ata area.]** — Trudy Inst. Zool. Akad. Nauk Kazakh. SSR **12,** 86-90. [In Russian.] **1782**

Balantidium was found in faeces from 1,064 of 1,576 pigs; the parasites were commonest in pigs aged between 2 months and 7 years and they were found in only 1 of 141 pigs less than 21 days old. Faeces from 467 human beings, including 27 piggery workers were examined, and the seven cases of *Balantidium* infection were all piggery workers.—R.M.

See also absts. **1918-1921** (trichomonads and atrophic rhinitis in swine).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Rosival, F., Bíro, I. & Havrila, J. (1960). Pozorovanie atypického priebehu slintačky a krívačky v Kapušianskych Kl'ačanoch v okrese Trebišov. [**Atypical foot and mouth disease in immunized cattle in Slovakia.**]—Veterinářství **10,** 456-458. [In Slovak.] **1783**

Of 130 housed cattle, vaccinated against F. & M. disease three months before an outbreak, 35 fell ill with severe clinical symptoms. Of 25 sucking calves from infected cows, only two developed the disease. Both were from dams with teat lesions. Experimental infection with saliva from infected cows of calves and of g.pigs and mice failed, but Type O and Type A virus were demonstrated in material sent to a laboratory.—E.G.

Dhennin, Lé., Heim de Balsac, H., Verge, J. & Dhennin, Lo. (1961). Du rôle des parasites dans la transmission naturelle et expérimentale du virus de la fièvre aphteuse. [**Role of arthropod parasites in the natural and experimental transmission of foot and mouth disease.**]—Rec. Méd. vét. **137,** 95-104. [Summaries in English and Spanish.] **1784**

F. & M. disease developed in g.pigs inoculated with aqueous extracts of *Musca domestica* and *Lucilia sericata* that had been kept for 48 hours in a receptacle containing fragments of infected vesicles; in a cow but not in g.pigs inoculated with crushed *Ixodes ricinus* that had fed on an infected cow; and in a heifer but not in g.pigs inoculated with crushed *Melophagus ovinus* that had fed on an experimentally infected sheep. Experiments are continuing with further species of arthropods and with helminths.—M.G.G.

Thorne, H. V. & Burrows, T. M. (1960). **Aerosol sampling methods for the virus of foot-and-mouth disease and the measurement of virus penetration through aerosol filters.**—J. Hyg., Camb. **58,** 409-417. [Authors' introduction modified.] **1785**

Efficient sampling methods are necessary for the study of airborne transmission of the virus of F. & M. disease. Experiments are reported here which show that aerosols of the virus like those of a few other viruses, can be reproducibly and quantitatively sampled by slight modification of standard aerosol sampling methods. The application of these methods to the determination of the penetration of virus through materials used in air filtration systems is also described.

Bradish, C. J. & Farley, J. O. (1960). **Studies of the virus of foot-and-mouth disease: a relationship between complement-fixing activity and neutralization of infectivity.** — Virology **12,** 324-328. **1786**

A study was made of the relationship between the results of the c.f. and the neutralization tests applied simultaneously to a series of virus-antibody mixtures. Mixtures (of complement, serum and virus) each containing one 70% haemolysis unit of complement were incubated at 37°C. for half an hour. Before addition of haemolytic indicator and completion of the c.f. test, a portion of the mixture was titrated in g.pigs and on monolayers of pig kidney cells (the 2 methods of titration gave similar results). Parallel studies of c.f. activity and of infectivity were made on the same mixture. Results suggest that mechanisms of antigen-antibody interaction of the type formulated by M. Heidelberger and by R. J. J. Goldberg are probably applicable to these neutralization and c.f. studies.—T.E.G.R.

Polatnick, J. & Bachrach, H. L. (1960). **Action of foot-and-mouth disease virus and metabolic poisons on bovine kidney cell cultures.**—Proc. Soc. exp. Biol., N.Y. **105,** 601-605. [Authors' summary modified.] **1787**

Bovine kidney cells resisted high concentrations of poisons of the glycolytic cycle, the citric acid cycle, and the cytochrome oxidation chain, as measured by respiration and cell loosening from the glass. F. & M. disease virus did not affect results, possibly because respiration of the cells is more dependent on other metabolic cycles. Iodoacetate and fluoride (in concentrations which greatly decrease glycolysis) decreased virus production more than other poisons; malonate had an insignificant effect, while the greater effect of fluoroacetate was probably due to its removal of viral precursors. The fact that maintenance of infected cells in an anaerobic environment did not affect virus production was a further indication that glycolytic sequences of the host cell are more essential to viral replication than oxidative sequences.

Armbruster, O., Garbe, H. G., Pilz, W. & Schweckendiek, O. E. (1960). Zum Problem der aktiven Immunisierung des Schweines gegen MKS mit verschiedenartigen Vakzinen. [**Active immunization of pigs against foot and**

mouth disease with various vaccines.] — Vet.-med. Nachr. No. 2 pp. 75-80. **1788**

Details were given of evaluation in adult pigs of nine concentrated, inactivated monovalent Type C foot-and-mouth disease vaccines, which included a commercial vaccine of bovine origin, virus of porcine origin, adsorbed on either aluminium hydroxide or salicylate and inactivated by either formalin or hydroxylamine hydrochloride, and an oil-emulsion adjuvant vaccine. None of these vaccines produced satisfactory immunity. Since non-vaccinated controls proved completely immune to challenge after recovery from test infection with virulent material, it appeared that successful vaccination is possible, provided a suitable attenuated virus can be found.—E.G.

Ercegovac, D. (1960). [**Pathogenesis of Aujeszky's disease.**] — Acta vet., Belgrade **10,** No. 1 pp. 3-10. [In Serbian. Summary in German.] **1789**

The mechanism of infection in Aujeszky's disease was studied in rabbits. After i/v infection the incubation period was nearly twice as long as that after intracerebral infection, or i/d infection on the head. Following i/d or s/c infection on the head, the virus soon spread to the medulla oblongata or the pons, where the cranial nerves, which innervate the sites of infection originate. It was concluded that the virus does not multiply in the blood but is capable of progressing fairly rapidly in the intraneural fluid from the periphery to the c.n.s.—E.G.

Kojnok, J., Oláh, P. & Surján, J. (1960). Beiträge zur Ätiologie der endemischen Lungenentzündung der Schweine. [**Aetiology of endemic pneumonia in pigs, associated with Aujeszky's virus.**] — Acta vet. Acad. Sci. hung. **10,** 347-357. [In German.] **1790**

In a piggery where pneumonia was endemic, Aujeszky's virus was regularly isolated from lung material of pork pigs, weighing 40–55 kg. Secondary infection with pasteurella organisms was frequent.

Experimental infection in pigs with pasteurella alone, isolated from spontaneous cases, failed to produce the disease. Intratracheal application of a tissue culture suspension of Aujeszky's virus produced pneumonia and in some nervous symptoms. Symptoms in pigs infected with both virus and pasteurella did not differ appreciably from those produced by the virus alone.—E.G.

Wamberg, K. (1960). Rabies i Grønland. [**Rabies in Greenland.**]—Nord. VetMed. **12,** 769-796. [In Danish. Summaries in English and German.] **1791**

Although rabies has been suspected in Greenland for over 100 years, it was not until 1959 that diagnosis was verified by examination of heads from dogs and foxes. What was apparently the first human case occurred in 1960. W. described the control measures that were introduced in 1959.—R.M.

Baláž, A., Spiesz, Š., Neshýba, Č. & Čanda, Š. (1961). Besnota domácich prežúvavcov na východnom Slovensku. [**Rabies in ruminants in Eastern Slovakia.**] — Veterinářství **11,** 43-48. **1792**

A rabid wolf bit 51 cattle, 3 horses, 2 goats and 3 dogs. Of these 14 cows and one goat developed the disease. During the outbreak two persons were bitten, one of whom died, and the disease was reported in a cat, a fox and in a wolf found dead. The majority of ruminants developed the dumb form.—E.G.

Lindner, H. (1960). Der Nachweis von Negrischen Körperchen mit der Färbung nach Muromzew. [**Demonstration of Negri bodies by the staining method of Muromtsev.**] —Mh. VetMed. **15,** 557-560. **1793**

Negri bodies were stained by the methylene blue and tannic acid method, first described by Muromtsev in 1926. Examined by the oil-immersion lens, Negri bodies appear purplish red with a deep blue to black inner zone. By phase-contrast microscopy they are deep reddish-brown with the basophilic inner structure appearing as a mass of greenish to light blue iridescent bubbles. This method is said to be suitable for decomposing material. —E.G.

Niven, J. S. F., Armstrong, J. A., Andrewes, C. H., Pereira, H. G. & Valentine, R. C. (1961). **Subcutaneous "growths" in monkeys produced by a poxvirus.**—J. Path. Bact. **81,** 1-14. [Authors' summary modified.] **1794**

Material from spontaneous subcutaneous cellular growths in rhesus monkeys contained a filtrable agent which passed through a 0·65 μ gradocol membrane and transmitted the condition to rhesus and cynomolgus monkeys. The agent did not grow in mice or on the chorio-allantoic membrane of embryonated eggs, nor did it produce transmissible lesions in rabbits.

The growths consisted of pleomorphic polygonal cells derived from the fibrocytes of

the dermis and subcutaneous tissue. No evidence of neoplasia was found and no similar lesions were detected in other organs, either in naturally or experimentally infected monkeys.

Virus particles having the morphological and cytochemical characters of vaccinia elementary bodies were readily identified. In the cells of the growths, developmental stages resembling those found in cells infected with known pox viruses were detected by electron microscopy.

Regression of the lesions was the rule, and after this had begun the monkeys were immune to challenge.

No immunogenic relationship with vaccinia has been established. The agent is probably a hitherto undescribed member of the pox group.

Kornyushenko, N. P. & Maximovich, N. A. (1961). **Intrauterine transmission of influenza infection in experimental animals.** — Acta Virologica, Prague **5**, 26-30. [In English.] **1795**

Embryonic and new-born mice from mothers infected with influenza virus 3–4 days before delivery, yielded the virus and had histological changes in the lungs. The virus was also isolated from the lungs of 4 out of 26 new-born rats from infected mothers, but no histological changes were seen. It was demonstrated in the foetal membranes but not the offspring of infected g.pigs and a rabbit. —M.G.G.

Hess, A. D., Smith, J. V. & Lamotte, L. C. (1960). Analisis de las tasas de transmision de la encefalitis en los estados occidentales de Estados Unidos. **[Analysis of encephalitis transmission patterns in the western U.S.A.]** — Bol. Ofic. sanit. pan-amer. **49**, 462-465. [Summary in English.] **1796**

A study was made, during 1955–59, of the spread of St. Louis encephalitis (SLE) and western equine encephalomyelitis (WEE) in western U.S.A. A pattern of regional distribution was observed: WEE predominated in the northern area and both viruses were highly active in the southern area. Outbreaks of both diseases occurred in the central zone, SLE being more sporadic and localized than WEE. The patterns of spread of the two viruses showed marked variations from year to year.—T.E.G.R.

Anon. (1960). **Veterinary meeting F.A.O./O.I.E. on horse sickness (Beirut, 3-5 August 1960).**—Bull. Off. int. Epiz. **53**, 1182-1201. [In French pp. 1160-1181.] **1797**

An account is given of the F.A.O./O.I.E. meeting on African horse sickness. The various representatives outlined the epidemiology of the disease and the control measures adopted in their respective countries. Broadly speaking, control is based on vaccination, restriction of movement of animals, destruction of infected animals, and vector control. An abstract is given of the report by P. G. Howell (Onderstepoort Veterinary Laboratory) and a discussion of certain points arising from it. Matters discussed in connexion with control included: problems regarding the use of vaccines; choice, availability and cost of vaccines; restriction of movement of infected animals; vector control; national and international control programmes. Recommendations were made on points raised in the discussion.—T.E.G.R.

Wołoszyn, S. & Rubaj, B. (1960). Influenza a wirusowe ronienie klaczy. **[Influenza and virus abortion in mares.]** — Med. Wet., Warszawa **16**, 710-716. [In Polish. Summaries in English, French, German and Russian.] **1798**

Many abortions occurred during an outbreak of influenza in a state stud in the 8th–11th months of pregnancy, within 11–18 days from the onset of illness and 77·8% of the affected mares aborted. Bacteriological examination of foetuses and serological examination of the mares' blood proved negative. The blood of affected mares showed marked leucopenia and lymphocytosis. Inclusion bodies were seen in the foetal internal organs and pregnant g.pigs inoculated with bacteria free filtrate of foetal internal organs aborted within 5 to 11 days. —M. Gitter.

Jubb, K. V., Saunders, L. Z. & Stenius, P. I. (1960). Die histologischen Augenveränderungen beim bösartigen Katarrhalfieber des Rindes. **[Histology of eye lesions in bovine malignant catarrh.]** — Schweiz. Arch. Tierheilk. **102**, 392-400. [In German. Summaries in English, French and Italian.] **1799**

Inflammatory eye lesions in bovine malignant catarrh included almost always keratitis, iridocyclitis and retinitis, rarely chorioiditis. Histologically there was erosion of the corneal epithelium, calcification of Bowman's membrane [not described before in veterinary ophthalmology], proliferation of scar tissue, mononuclear infiltration, oedema

of optic nerve fibres, arteritis, periarteritis, and phlebitis. Retinitis was confined to the vascular and not the neural elements. Similar eye lesions have been described in swine fever, dog distemper, Borna disease and rabies. Corneal opacity has been seen in virus diarrhoea Indiana, purulent ophthalmia in listeriosis. The possible association between eye lesions of this nature and neurotropic virus diseases in animals is discussed.—E.G.

Menšík, J., Boháč, J. & Šetka, R. (1960). Studie o etiologii infekční orchitidy býků v ČSSR. **[The aetiology of infectious orchitis in bulls in Czechoslovakia.]** — Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5,** 685-700. [In Czech. Summaries in German and Russian.] **1800**

This is an aetiological study of a form of chronic orchitis and epididymitis, which is endemic in bulls in A.I. centres in Czechoslovakia. Its infectious character was established by experimental transmission to bulls and heifers. In bulls the clinical picture was that of uni- or bilateral orchitis, painful swelling of the spermatic cord and oedema of the testicular tunics, followed by gradual testicular atrophy. In the testicular parenchyma there were greyish-yellow diffuse foci resembling granulation tissue. In heifers there was mucopurulent vaginitis, and in some cystic ovarian degeneration and endometritis. From testicular biopsy samples and ejaculate of 25 affected bulls, a virus was isolated 14 times on the chorio-allantois of chick embryos. A 10% suspension of chorio-allantoic membranes from chick embryos of the 2nd–4th passage produced in bulls and heifers a condition closely resembling natural infection. The virus was recovered from organs, ejaculate, testicles, vaginal mucus and ovarian cyst fluid of experimentally infected animals [see also *V.B.* **31,** 1120.]—E.G.

Kubin, G. & Klima, J. (1960). Experimentelle Untersuchungen über das Virus des Bläschenausschlages des Rindes. **[Experimental studies on the virus of coital vesicular exanthema of cattle.]** — Wien. tierärztl. Mschr. **47,** 741-760. [Summaries in English, French and Italian.] **1801**

The virus grew in cultures of kidney cells from bovine foetuses, calves and rabbits. In embryonated eggs it survived for several passages but did not multiply. Virulence of freeze-dried virus did not diminish on storage. In cows, symptoms first appeared 48 hours after and neutralizing antibodies 14 days after infection. Mice, g.pigs and rabbits were not susceptible. An immune serum was produced in rabbits by six i/v injections each of 1 ml. of culture, at intervals of four days. Cytopathogenicity of the virus was studied under the electron-microscope. The virus passed membrane filters of a pore size of 300–450 mμ, but not Seitz EK filters.—E.G.

Wight, P. A. L. (1961). **The histology of the spinal and sympathetic ganglia and the adrenal glands in scrapie disease of sheep.**— J. comp. Path. **71,** 53-59. [Author's conclusions.] **1802**

Vacuolated neurones, similar in appearance and in numbers, were observed in the spinal and sympathetic ganglia of many healthy and scrapie sheep. No specific contents were demonstrable in the vacuoles. An eosinophilia of the medulla was also found in both groups particularly in older sheep.

There was no significant morphological change in the spinal or sympathetic ganglia in scrapie disease, which suggests that the symptoms are not caused by lesions in these ganglia. The available evidence indicates that they are due to lesions in the central nervous system.

No difference was found between the adrenal glands of healthy sheep and those with scrapie.

I. Pinkiewicz, E. (1960). Zmiany anatomopatologiczne i wtórne zakażenia bakteryjne a ilościowy stan leukocytów w ostrej postaci pomoru świń. **[Lesions and secondary bacterial infections with regard to the number of leucocytes in acute swine fever.]** — Ann. Univ. M. Curie-Skłodowska Sect. DD **13,** 89-94. **1803**

II. Pinkiewicz, E. (1960). Wpływ układu przysadkowo-nadnerczowego na kształtowanie się cytologicznego obrazu krwi obwodowej przy ostrej postaci pomoru świń. **[The effect of the pituitary-adrenal system on blood cytology in acute swine fever.]** — Ibid. **13,** 95-112. **1804**

III. Pinkiewicz, E. (1960). Biały obraz krwi i zjawisko leukergii w przebiegu ostrego pomoru świń. **[The white blood cell picture in acute swine fever.]**—Ibid. **13,** 247-267. [In Polish. Summaries in English and Russian.] **1805**

I. There was no relationship between the number of w.b.c. and lesions found P.M. in 149 pigs in which acute swine fever had been set up.

Of 109 of these pigs examined bacterio-

logically, secondary bacterial infections were diagnosed in 26; no relationship was found between the number of w.b.c. and these secondary infections.

II. In experimental swine fever studied in 24 pigs there was no relationship between the blood cytology and the levels of Na, K and Ca. The blood picture resembled that found in normal pigs after administration of corticotrophin. The fluctuations in the level of sodium were within the normal range. Potassium levels either (a) rose continuously, until the pigs were bled out, (reaching 37 mg. in 12 cases) or (b) remained within the normal range (in 6 cases), or (c) rose gradually till the 3rd or 4th day after infection, and then fell back to normal (6 cases). The calcium level fell as the disease progressed and remained below the normal range. Histological examination of the adrenal cortex in bled out pigs revealed widening of the zona fasciculata and narrowing of the remaining layers. In the zona fasciculata there was an increase in the number of cells and their nuclei and many lightly staining apparently active cells.

III. During the course of acute swine fever leucopenia, normal w.b.c. counts and even leucocytosis were recorded. There was a marked shift to the left and an increase in the numbers of polymorphs with some showing degenerative changes. A characteristic picture appeared on the 5th and 6th day of the disease when mainly metamyelocytes and myelocytes, showing degenerative changes, were seen. As the disease progressed there was a gradual fall in the numbers of eosinophiles and monocytes until they finally disappeared completely from the peripheral circulation. The number of basophiles increased in the initial stages but later they disappeared.—M. Gitter.

Beckenhauer, W. H., Brown, A. L., Lidolph, A. A. & Norden, C. J., Jr. (1961). **Immunization of swine against hog cholera with a bovine enterovirus.** — Vet. Med. **56,** 108-112. **1806**

Following up the report by Darbyshire [*V.B.* **30,** 2897] of a serological relationship between swine fever virus and a virus of a "mucosal disease" of cattle in England, the authors found that 21 pigs inoculated with an Oregon strain of virus diarrhoea virus were all protected against challenge with virulent swine fever virus. One pig inoculated with a Nebraska strain of mucosal disease virus and another with a Nebraska strain of virus diarrhoea virus were not protected against challenge with virulent swine fever virus.

Other experiments indicated that the Oregon virus diarrhoea virus did not spread by contact from inoculated pigs to susceptible pigs.

On these results the authors speculate about the origin of the swine fever virus and on the possible use of a virus of the bovine mucosal disease complex for immunizing pigs against swine fever.

Mayr, A. & Hecke, F. (1960). Epidemiologische, pathogenetische und immunologische Untersuchungen bei der Teschener Krankheit der Schweine. **[Teschen disease: epidemiology, pathology and immunology.]** — Bull. Off. int. Epiz. **54,** May pp. 438-444. [In German. Summary in French. In English pp. 445-448.] **1807**

The virus of Teschen disease is excreted in faeces for as long as 7 weeks; infection spreads rapidly in an inapparent form and the disease cannot, therefore, be effectively controlled by slaughter alone. In an outbreak in Germany all the pigs on 5 infected farms were slaughtered and for the next 6 months neutralization tests on all pigs slaughtered in the district revealed a high incidence of reactions. The epidemiological importance of inapparent infection was also demonstrated experimentally. The disease occurs in 3 stages characterized by presence of the virus in: the digestive and lymphatic systems; the blood vascular system; the nervous system. The paralytic stage is rarely reached. Satisfactory control is based on slaughter of animals on infected farms together with vaccination of susceptible animals around the foci. A formolized and a modified live vaccine were prepared from virus grown on pig kidney cultures. The choice of vaccine depends on the individual outbreaks, and on immunological and epidemiological data.—T.E.G.R.

Hecke, F. (1961). Untersuchungen über den Ausscheidungsweg des Virus der ansteckenden Schweinelähmung (Teschener Krankheit) nach intrazerebraler Infektion. **[Excretion of Teschen disease virus after intracerebral infection.]**—Mh. Tierheilk. **13,** 30-42. **1808**

After intracerebral inoculation, porcine encephalomyelitis virus was demonstrable in the olfactory bulb and the ethmoid region during the incubation period, later in the nasal mucosa and in the sciatic nerve. It was not demonstrable in blood, viscera and lymph

nodes. In nasal and oral washings it was present on the second day after infection, in faeces usually after the onset of clin. symptoms and then often in large amounts. Transmission by droplet infection of nasopharyngeal mucus appears possible, but faeces are an important source of infection. —E.G.

Greig, A. S. (1961). **Tissue culture studies and electron microscopy of the virus of Teschen disease.** — Canad. J. comp. Med. **25**, 3-7. [Author's summary modified.] **1809**

Three of four strains of Teschen disease virus were grown on pig kidney epithelial cells, developed high titres after several serial passages, and exerted cytopathic effects leading to complete destruction of the cultures from 2 to 8 days after inoculation. The virus in tissue culture was specifically neutralized by immune and hyperimmune pig sera. Electron microscope studies showed the virus to be a spherical body with an average diameter of 30 mμ.

Menšík, J. (1960). Vliv mikroklimatických podmínek na vznik a vývoj onemocnění u selat po experimentální infekci virem chřipky prasat. [**Influence of microclimate on the course of experimental piglet influenza.**] — Věd. Práce Ústavu vet. Brno **1**, 99-111. [In Czech. Summaries in German and Russian.] **1810**

Piglets housed in a cold, damp, concrete piggery at temperatures varying from 1° to 10°C. and a relative humidity of 95–100% were highly susceptible to intranasal infection with piglet influenza virus, whereas a control group in outdoor runs with insulated shelters at temperatures from −13° to +2°C., relative humidity 75–85%, either completely resisted infection or developed a mild form of the disease of short duration.—E.G.

Menšík, J. (1960). Průkaz viru chřipky mimo respirační trakt A. V perikardu a v perikardiálním výpotku. [**Extra-respiratory demonstration of influenza virus in piglets. A. In pericardium and pericardial exudate.**] —Věd. Práce Ustavu vet. Brno **1**, 113-132. [In Czech. Summaries in German and Russian.] **1811**

M. discussed the presence of serofibrinous and fibrinous pericarditis in piglets from influenza-infected piggeries. He isolated influenza virus from the pericardium and pericardial fluid of 5 runts from infected piggeries and 9 experimentally infected piglets and discussed the possible relationship between unthriftiness and exposure to influenza during uterine or early post-natal life, even when characteristic lung lesions are absent. He stated that the virus may persist for some time in the body, not necessarily in the respiratory system. The virus was recovered from pericardium and pericardial fluid 9–79 days after experimental infection.—E.G.

Gillespie, J. H. & Karzon, D. T. (1960). **A study of the relationship between canine distemper and measles in the dog.** — Proc. Soc. exp. Biol., N.Y. **105**, 547-551. [Authors' summary modified.] **1812**

All of 11 dogs inoculated with live measles virus developed neutralizing and c.f. antibodies; they showed no signs of illness and did not spread the infection to litter mates. Seven developed low titres of canine distemper neutralizing antibody. All the dogs, including those with no demonstrable canine distemper neutralizing antibody, were protected against intravenous or intracerebral challenge with virulent canine distemper virus, while the contact controls, not receiving measles virus, became ill, and some died. The dogs which had received distemper virus alone developed distemper neutralizing antibody, but not measles neutralizing antibody.

Ryzantseva, N. E., Revenok, N. D., Shroĭt, I. G. & Shlyakhov, E. N. (1960). [**Immunological relationship between measles and canine distemper viruses. I. Inoculation of distemper virus into puppies previously inoculated with measles virus.**] — Voprosy Virusologii **5**, 577-582. [In Russian. Summary in English.] **1813**

Puppies inoculated with blood from children in the early stages of measles developed fever, depression, eruption on mucous membranes, and hyperaemia of the conjunctiva. The virus was present in blood from 2 to 8 days after infection. Five puppies were challenged with distemper virus 30–45 days after recovery from measles infection, and all developed distemper. [An English translation will appear in *Problems of Virology*, **5**, No. 5.]—R.M.

Oláh, P. (1960). **Serological investigations on infectious canine hepatitis (Rubarth's disease).**—Acta vet. Acad. Sci. hung. **10**, 411-422. [In English.] **1814**

It was not possible to demonstrate canine hepatitis virus in the blood of infected dogs by the c.f. test. But the virus was demon-

strable in organs and in peritoneal fluid. Antibodies were generally present 6–8 days after infection and persisted for up to eight months. There was evidence that inclusion bodies demonstrated were caused by hepatitis virus. Of 721 dogs, picked at random, 164 yielded positive c.f. reactions. Convalescent and immune sera gave specific gel diffusion reactions. The value of the gel diffusion test for the quantitative titration of virus, the differentiation between hepatitis and distemper and between convalescent and immune dogs, was described.—E.G.

Ablett, R. E. & Baker, L. A. (1961). **Canine virus hepatitis serum neutralizing antibody levels of brood bitches having a history of puppy loss.**—J. Small Anim. Pract. **1,** 174-178. [Authors' abst. modified.] **1815**

Sera from 45 bitches, from 15 kennels, whose puppies had died during the first five weeks of life, were examined for neutralizing antibodies to canine virus hepatitis; 37 had high titres thought to be indicative of recent or active infection. The possible association with the mortality in the puppies is discussed.

Torlone, V. (1960). Agente citopatogeno isolato da una forma rino-congiuntivale del gatto. **[Isolation of a virus from cats with rhino-conjunctivitis.]** — Vet. ital. **11,** 915-928. [Summaries in English, French and German.] **1816**

A cytopathic effect was produced on cat's trypsinized kidney cells by suspensions of scrapings of conjunctiva or of nasal mucosa from a cat with rhino-conjunctivitis. The cytopathic agent was passaged and 8th passage material was used for further experiments. Experimental transmission was achieved in cats (but not in mice, g.pigs, rabbits or hamsters) by ocular or intranasal inoculation. Multiplication of the virus was not achieved in other tissue cultures or in 7 to 11-day embryonated eggs. Neutralization tests with immune sera against a number of viruses isolated from cats gave negative results. Positive results were obtained with the serum of a cat surviving natural infection; of cats surviving experimental infection; and of 3 of 8 apparently healthy cats. A hyperimmune serum was prepared in rabbits by i/v injection of stock virus. Pathological findings and cytopathic effects were in no way similar to those produced by any of the known viruses of cats. The cytopathic effect was rapid (4–18 hours) and was characterized by the formation of a paranuclear cytoplasmic mass similar to that produced by polioviruses.—T.E.G.R.

Marshall, I. D. & Fenner, F. (1960). **Studies in the epidemiology of infectious myxomatosis of rabbits. VII. The virulence of strains of myxoma virus recovered from Australian wild rabbits between 1951 and 1959.** — J. Hyg., Camb. **58,** 485-488. [Authors' summary modified.] **1817**

Between February 1951 and July 1959, 672 strains of myxoma virus were recovered in Australia. All, except thirteen from mosquitoes, were from wild rabbits. They were tested for virulence by intradermal inoculation of small groups of rabbits with a small dose of virus. Based primarily on survival times, strains were allocated to five grades of virulence. There has clearly been a trend from a predominance of highly virulent strains in the initial epidemics to a mixture of strains of virulence varying from very high (rarely) to very low. For the last 6 years the proportion of strains of different virulence grades has remained almost constant, just over half being moderately virulent.

Schmidt, U. (1960). Über die Variabilität des Geflügelpestvirus. **[Variability of fowl plague and Newcastle disease viruses.]**—Arch. exp. VetMed. **14,** 1012-1024. **1818**

S. attempted to alter the properties of the "Nerlich" strain of N.D. virus (isolated at the Friedrich Loeffler Institute from a fowl in 1954) by means of 200 passages in chicks aged up to 10 days, in order to test a hypothesis that classical fowl plague virus was a laboratory product. The "Rostock" strain of fowl plague virus was used for comparison. After 200 chick passages the Nerlich strain had assumed some of the properties of fowl plague virus as regards neutralization and H.I. tests, but it remained unchanged in its action on erythrocytes and in experimental transmission to mice. There was no cross immunity between passaged virus and classical virus. Nevertheless, S. concluded that the possibility of transformation of N.D. virus into fowl plague virus could not be excluded.—R.M.

Cavrini, C. & Cabassi, N. (1960). Pseudopeste spontanea in pappagalli della specie Amazona ochrocephala. **[Outbreak of Newcastle disease in parrots.]** — Nuova Vet. **36,** 123-128. **1819**

An account is given of an outbreak of Newcastle disease among parrots, *A. ochrocephala,* 3 days after their arrival in

Italy by air from Colombia. The disease spread by direct contact to a peacock, a jungle fowl, a macaw *(Ara severa)* and a guinea-fowl *(Acryllium volturinum)*. The macaw and the jungle fowl died and the survivors developed nervous symptoms. Newcastle disease virus was isolated in embryonated eggs and, from its biological characters, it was assumed to be an exotic strain.—T.E.G.R.

Fritzsche, K. (1961). Ein Beitrag zum Vorkommen von Newcastle-Virus im Augenkammerwasser der Hühner. **[Newcastle disease virus in the aqueous humour of hens.]** —Berl. Münch. tierärztl. Wschr. **74,** 71-73. [Summary in English.] **1820**

Newcastle disease virus was detected neither in the aqueous humour nor in the brain of 14 hens that survived an outbreak of Newcastle disease 10 months previously. —M.G.G.

Baczyński, Z. (1960). Nosicielstwo i siewstwo wirusa rzekomego pomoru drobiu (Newcastle disease). III. Dżdżownice. **[Carriers and disseminators of Newcastle disease virus. III. Earthworms.]** — Med. Wet., Warszawa **16,** 656-658. [In Polish. Summaries in English and Russian.] **1821**

The virus could survive 7 days in soil and 4 days in earthworms.—M. Gitter.

Benedict, A. A., Lee, D. & West, B. (1960). **Failure to demonstrate infectivity of Newcastle disease virus nucleic acid preparations.** —Nature, Lond. **188,** 911-913. **1822**

The ribonucleic acid (RNA) fraction, in contrast with the intact virus, is sensitive to ribonuclease, is thermolabile and sediments very slowly on centrifugation. RNA fractions of Newcastle disease virus, prepared by the cold phenol technique, were not infective for chick embryos and in attempts to obtain an infective fraction the various factors involved were studied: infective material—crude allantoic fluid, partially purified concentrated allantoic fluid and chorio-allantoic membranes; method of extraction—phenol (hot or cold), urea, guanidine; ionic strength of diluent; host; route of infection; relationship between RNA infectivity and growth phase of virus. There was no direct proof that RNA is responsible for infectivity or agglutinins. —T.E.G.R.

Knežík, J., Vrtiak, O. J., Jantošovič, J. & Tehlár, F. (1960). Skúsenosti s immunizáciou kurčiat v teréne vakcínou B_1 podanou v pitnej vode. **[Field immunization of chicks with B_1 vaccine in drinking water.]**—Folia vet., Košice **4,** 147-161. [In Slovak. Summaries in English, German and Russian.] **1823**

A drinking-water vaccine against Newcastle disease, prepared from 1–2 ml. of avirulent virus per litre of drinking water, containing 3 g. of stabilizer consisting of gelatin and powdered milk in a proportion of 2 : 1, was satisfactory in a field trial on 23,526 chicks aged 3–8 weeks. Immunity lasted for at least 4 months. Vaccination was not recommended in flocks where there was salmonellosis, coccidiosis or vitamin deficiency, since it appeared to increase the number of deaths. Flocks with coccidiosis should be pretreated with sulphonamides.—E.G.

Vasington, J. J., Laffer, N. C., Holst, A. P. & DeVolt, H. M. (1960). **Studies on the protective value of Newcastle-immune serum and gamma globulin against artificially induced Newcastle disease of chickens.**—Poult. Sci. **39,** 1418-1427. [Authors' summary modified.] **1824**

Intramuscular injection of 4 to 8 ml. of immune serum and 1 to 2 ml. gamma globulin simultaneously with, or 1 to 2 weeks before challange by i/m inj. of Newcastle disease virus produced significant protection in chickens. The protective value of immune globulin was roughly inversely proportional to the interval between passive immunization and challenge.

Partial protection was obtained when 2 ml. of gamma globulin was administered to birds averaging 1·25 lb. and receiving 10^5 ELD_{50} infective units of virus.

Pollard, M., Starr, T. J., Tanami, Y. & Elliott, A. Y. (1960). **Cytochemical effects of substituted pyrimidines on psittacosis virus.** — Proc. Soc. exp. Biol., N.Y. **105,** 476-478. [Authors' summary modified.] **1825**

Cytochemical changes caused by psittacosis virus in tissue cultures were studied by acridine orange staining and fluoresence microscopy. Normal virus development was interrupted by the addition of 5-fluorouracil and 5-fluoro-orotic acid which caused accumulation of "fraudulent" ribonucleic acid. It is suggested that the substituted pyrimidines interfered with virus growth by inhibiting protein synthesis.

Waters, N. F. & Fontes, A. K. (1960). **Genetic response of inbred lines of chickens to Rous**

sarcoma virus.—J. nat. Cancer Inst. **25,** 351-357. [Authors' summary modified.] **1826**

This study demonstrates genetic variation among unrelated inbred families of White Leghorns, when inoculated intracerebrally at 1 day of age with Rous sarcoma virus. The differences in response, both within and between lines, were marked. The progeny from line 10 representing 4 different sire matings, each mated to different groups of females, were completely susceptible and all died from the disease induced by inoculation. In contrast the progeny from line 7 representing 3 different sire matings, were highly resistant and only 2 chickens of 327 died. Progeny from lines 6, 9 and 15 showed considerable genetic diversity in response. Within lines the progeny from some males showed considerable resistance, while the progeny of others all died before 25 days of age. Likewise, progeny from dams showed similar genetic diversity of response to Rous sarcoma virus, some being completely resistant and others completely susceptible.

Kožušník, Z. (1960). K otázce výskytu ornitózy ve východních Čechách. **[Psittacosis in Eastern Bohemia.]**—Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5,** 789-798. [In Czech. Summaries in German and Russian.] **1827**

The seasonal incidence of atypical pneumonia due to psittacosis virus among duck pluckers was studied in a processing plant, which handled nearly 115,000 birds during the first nine months of 1959. Of 743 random duck blood samples from 24 farms with a duck population of 6,086 birds examined by the c.f. test 336 were positive. Incidence among pluckers decreased, when carcasses were immersed for 2 min. in water of a temp. of 55°C.—E.G.

Lenhert, C. & Hille, G. (1960). Serologische Ornithose-Untersuchungen in Zucht- und Mastentenbeständen. **[Serological examination for psittacosis in duck breeding and fattening establishments.]** — Berl. Münch. tierärztl. Wschr. **73,** 441-444. [Summary in English.] **1828**

Details were given of examination for psittacosis by the c.f. reaction of 1428 blood samples, from 70 farms with a duck population of 47,000. Of these 233 yielded positive, and 100 doubtful reactions. About half of the duck farms were free from the disease. Incidence was higher in fattening than in breeding establishments. On one farm there was evidence of transmission of the disease to seven of the farm personnel.—E.G.

Pitre, J. (1960). Les rickettsioses des bovidés et équidés dans le département du Calvados. **[Rickettsial infections of cattle and horses in Calvados, France.]**—Bull. Acad. vét. Fr. **33,** 459-462. **1829**

In Calvados department, of 292 cattle sera, 16% agglutinated *Rickettsia burneti* antigen alone, 2·4% psittacosis-lymphogranuloma virus Q 18 antigen alone, and 2·7% both antigens. Of 166 horse sera, 26% agglutinated *R. burneti* antigen alone, 3% the Q 18 antigen alone, and one both antigens. *R. burneti* infection was associated with fever and pulmonary symptoms, and sometimes abortion in cattle, and with recurrent colic, and icteric and pyretic conditions in horses. Treatment with tetracycline was effective.
—M.G.G.

Schaaf, J. (1961). Query-Fieber des Rindes. **[Q fever in cattle.]**—Mh. Tierheilk. **13,** 1-18. **1830**

Of 5 cows with Q fever, *Rickettsia burneti* was demonstrated in the milk of four and bronchial mucus of two, but not in urine, faeces, vaginal mucus, saliva, nasal or eye secretions. P.M., it was present in the udder of all five and in body lymph nodes and bone marrow of one cow each. It was not demonstrable in lungs, liver, spleen, kidneys, brain or intestinal lymph nodes. In another group of 21 reactors, *R. burneti* was isolated P.M. from the udder of 14 and the uterus of 3 of 12 pregnant cows. It was not demonstrable in the uterus of non-pregnant cows. *R. burneti* was isolated from the body lymph nodes of four and the liver and spleen of one. The infection was diagnosed in three herds by screening 2,721 milk samples. All of 1,232 flash-pasteurized milk samples, 2,000 blood samples from cattle and 2,000 from sheep were negative. The organism was isolated from the mammary gland of a vixen and from *Ixodes ricinus* collected from wild foxes. It was recommended that complement-fixation tests should always be supplemented by milk infectivity tests in laboratory animals. Tetracycline treatment was satisfactory in three laboratory workers, who became infected in the course of these investigations.—E.G.

See also abst. **1931** (interstitial pneumonia in fowls).

IMMUNITY

Wolfe, H. R., Amin, A., Mueller, A. P. & Aronson, F. R. (1960). **The secondary response of chickens given a primary inoculation of bovine serum albumin at different ages.**—Int. Arch. Allergy **17,** 106-115. **1831**

Chicks inoculated i/v with 40 mg. bovine albumin at 20 days of age did not give a secondary antibody response if re-inoculated at 6, 12 or 22 weeks of age. Chicks given a primary inoculation at 12 weeks of age gave a good secondary response when re-injected at 22 weeks.—R.M.

Warwick, W. J., Archer, O. & Good, R. A. (1960). **Passive transfer of delayed sensitivity to the newborn rabbit.** — Proc. Soc. exp. Biol., N.Y. **105,** 459-461. [Authors' summary modified.] **1832**

The new-born rabbit is limited in its capacity to accept the passive transfer of delayed hypersensitivity, as is the case in the human new-born. The ability to accept passively transferred delayed sensitivity develops by 4 weeks of age in new-born rabbits.

Burnet, F. M. & Boyer, G. S. (1961). **The chorio-allantoic lesion in the Simonsen phenomenon.** — J. Path. Bact. **81,** 141-150. [Authors' summary modified.] **1833**

Adult fowl leucocytes inoculated on to the chick chorio-allantois give rise to focal lesions with a striking superficial resemblance to viral pocks.

The average number of foci produced has a linear relation to the dose (approx. 1 focus per 2×10^4 leucocytes). The distribution of numbers within a titration series is not a normal one and may be due to genetic inhomogeneity in the embryos being used.

The histological development of the foci is described and illustrated. Most of the lesions are made up of host cells and it has not been possible to identify with certainty the donor cells which are presumably responsible for the pathogenic action. It is believed, however, that the evidence points increasingly towards rounded pyroninophilic cells best seen at the periphery of the lesion as the foreign pathogenic cells.

These findings are consistent with the view of Simonsen that the phenomenon is a graft versus host reaction produced by the implantation, proliferation and migration of immunologically active cells present in the donor blood.

Weigle, W. O., Dixon, F. J. & Deichmiller, M. P. (1960). **Effect of mycobacteria on antibody production induced by water-in-oil emulsions of soluble protein antigens.**—Proc. Soc. exp. Biol., N.Y. **105,** 533-541. [Authors' summary modified.] **1834**

In g.pigs the effect of mycobacteria in adjuvant on production of precipitating antibody to a constant amount of antigen depends upon the immunization scheme employed. With multiple injections of large doses of adjuvant, mycobacteria had no effect on antibody formation; with a single large dose there was a slight enhancing effect; and with a single small dose, there was an extreme enhancing effect. Mycobacteria had no effect on persistence of antibody production. Adjuvants containing mycobacteria produced considerably more extensive granulomata at injection sites than adjuvants alone. However, there was no relationship between size of the granuloma and antibody production. In g.pigs a small dose of adjuvant containing mycobacteria caused longer persistence of antigen (in the local adjuvant depot and in the whole body) and greater antibody production than adjuvant alone.

Gefen, N. E. & Gordon, G. Y. (1961). **[Aerosol immunization with dried live vaccines, and toxoids. V. Morphological changes in animals immunized by aerosols of some dust vaccines.]**—J. Microbiol., Moscow No. 1 pp. 40-46. [In Russian. Summary in English.] **1835**

Three hundred guinea-pigs, 20 sheep and 12 monkeys were exposed to aerosols of dried brucella, tularaemia, anthrax or plague vaccines and were killed 1–60 days later for histological examination of lungs, spleen, liver, kidneys, heart and lymph nodes. The histologal changes were similar to those found after s/c inj. of the vaccines, but in addition, aerosol administration provoked reaction of reticulo-endothelial tissue in the lungs and associated lymph nodes. [A translation will appear in *J. Microbiol. Epidemiol. Immunobiol.* **32,** No. 1.]—R.M.

I. Kolesov, S. G. (1961). **[Improving methods of prophylactic inoculation. Combined immunization.]**—Veterinariya, Moscow No. 1 pp. 27-29. [In Russian.] **1836**

II. Lysenko, I. P. & Tsymbal, A. M. (1961). **[Simultaneous immunization of pigs against**

swine fever, foot and mouth disease, Aujeszky's disease and swine erysipelas.]—Ibid. pp. 30-33. [In Russian.] **1837**

I. Simultaneous immunization of cattle against anthrax and blackleg has been practised for several years in the Soviet Union. K. discussed other combined immunizations, such as against paratyphoid, pasteurella and pneumoccal infections in calves and pigs, lamb dysentery, braxy and enterotoxaemia in sheep; Newcastle disease and fowl pox; plague, tularaemia and brucellosis in g.pigs.

II. Sixty-seven pigs aged 2–8 months were inoculated with one of the following combinations of vaccines: swine fever (SF) plus foot and mouth (F. & M.) disease; SF plus Aujeszky's disease; SF plus Aujeszky's disease plus swine erysipelas; SF plus F. & M. plus Aujeszky's disease plus erysipelas.

The vaccines were administered i/m, 20–40 min. after mixing. Inoculation was repeated once or twice, at 10-day intervals. Challenge with one or other of the causal agents was done 3 weeks or more after the last inoculation.

Synergy of antigens was observed. For example, SF vaccine (whether crystal violet or tissue vaccine) appeared to stimulate immunity derived from F. & M. vaccine administered at the same time, since 12 of 16 pigs resisted challenge by F. & M. virus whereas 2 inoculated with F. & M. vaccine alone developed generalized infection upon challenge. But if instead of equal volumes of each vaccine, 2·5 ml. SF plus 5 ml. of F. & M. vaccine was injected, the pigs appeared to be more susceptible to challenge with SF virus than pigs given SF vaccine by itself.

A mixture of equal parts of SF and Aujeszky's disease vaccines permitted the establishment of immunity to SF, but protection was only partial when a 1 : 2 mixture was injected.

Further experiments on 61 pigs indicated that when mixtures of all four vaccines were given, heterologous tissue present in Aujeszky's disease vaccine reduced the immunological response of the animals. Administration of anti-reticulocytotoxic serum 24 hours before combined immunization appeared to overcome this deficiency.—R.M.

See also absts. **1682-1686** (TB.); **1693-1695** (swine erysipelas); **1700** (fowl cholera); **1720, 1722-1725, 1731-1732** (brucellosis); **1741** (leptospirosis); **1745** (leptospira test); **1753** (transplacental transfer of tetanus antitoxin); **1765** (bovine contagious pleuropneumonia); **1780** (toxoplasmosis); **1786-1788** (F. & M. disease); **1806** (swine fever); **1807** (Teschen disease); **1813** (measles and distemper); **1815** (canine virus hepatitis); **1823-1824** (Newcastle disease); **1828** (psittacosis); **1850** (micro-precipitation on trichinella larvae); **1865, 1871 & 1878** (helminths); **1951** (anticomplementary action of aspirin).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Murray, M. D. (1960). **The ecology of lice on sheep. I. The influence of skin temperature on populations of Linognathus pedalis (Osborne). II. The influence of temperature and humidity on the development and hatching of the eggs of Damalinia ovis (L.).**—Aust. J. Zool. **8,** 349-356 & 357-362. [Abst. from author's summaries.] **1838**

I. Female *L. pedalis* were exposed to temperatures between 22 and 40°C. Most eggs were laid at 36 but none at 22°C. Eggs exposed to the same temperatures hatched only at 33, 36, and 38°. Most eggs hatched at 36°.

High humidities reduced the numbers of eggs laid and hatched even if the temperatures were favourable.

Temperatures near the skin of the legs of the same sheep and of the legs of different sheep may differ greatly, and those legs on which temperatures near the skin are above 30°C for the longest periods may become most heavily infested.

II. Morphogenesis of the eggs of *D. ovis* was completed only within the temperature range 30–39° but the most favourable range was 33–39°C. Most embryos within eggs incubated at 33–39° and maintained at r.h. between 7 and 92% completed their development but those exposed to 92% r.h., even for only the last 24 hours of their development, failed to hatch.

Conditions are more consistently suitable for oviposition, egg development and hatching near the skin of the body, which may account for the characteristic distribution of *D. ovis* on sheep.

Simintzis, G. (1960). Lieux de ponte d'Hypoderma bovis sur les bovidés. [**Sites of oviposition by Hypoderma bovis on cattle.**]—Bull. Acad. vét. Fr. **33,** 485-491. **1839**

Five groups, each of 6 calves, were treated externally with malathion at fortnightly intervals from May to the end of September. The average number of *H. bovis* larvae per calf in the following spring was 5·2 when only the posterior portion of the body was treated, 17·6 when only the anterior portion was

treated, 18·5 when only the lower half including the legs was treated, 4 when only the upper half was treated, and nil when the whole body, excluding the head, was treated. It was concluded that the dorsal region, in particular the lumbar portion, is the preferred site of oviposition of *H. bovis*.—M.G.G.

Drummond, R. O. (1960). **Preliminary evaluation of animal systemic insecticides.**—J. econ. Ent. **53**, 1125-1127. [Author's abst. modified.] **1840**

Seventeen compounds found to be active as systemic insecticides in laboratory tests with g.pigs, were used in tests with small numbers of cattle along with Bayer 23129 (*O, O*-dimethyl S-2(ethylthio) ethyl phosphorodithioate) to determine their systemic effect against warbles (*Hypoderma* spp.). Bayer 29493, Dowco 105, and Stauffer R-2371 gave 95 to 100% control of grubs at dosages tolerated by the cattle. The rest were ineffective or inconsistently effective or were too toxic for cattle.

Bayer 29493 is *O, O*-dimethyl *O*-(4-methylthio-*m*-tolyl) phosphorothioate, and Stauffer R-2371 is *O, O*-diethyl bis-(4-chlorophenyl) methyl phosphorodithioate.

O'Brien, R. D., Danterman, W. C. & Niedermeier, R. P. (1961). **The metabolism of orally administered malathion by a lactating cow.** — J. agric. Food Chem. **9**, 39-42. [Authors' summary modified.] **1841**

A cow weighing 1,252 lb. was given 748 mg. daily of malathion labelled with P^{32} in the food for 3 days (equivalent to 63 p.p.m. of the intake of dry matter); 90% of the metabolites were excreted in the urine; 69% in the first 4 days. The major metabolite was formed by carboxyester hydrolysis, but the principal faecal metabolite was dimethyl phosphate. The milk contained no malathion or malaoxon, but had 0·11 p.p.m. of radioactive substances, most of which could not be identified.

Roberts, F. H. S. (1960). **A systematic study of the Australian species of the genus Ixodes (Acarina: Ixodidae).**—Aust. J. Zool. **8**, 392-485. **1842**

A detailed description with appropriate figures is given for each species, including all known stages in the life cycle, together with data on host range and geographical distribution. The species found on domestic animals are :— *I. holocyclus*—cat, dog, pig, ox, sheep, goat, horse; *I. tasmani*—cat, dog, horse; *I. cornuatus*—cat, dog; *I. fecialis* and *I. hirsti* —cat; *I. australiensis*—dog, ox.—A. Culey.

Kusov, V. N., Pospelova, Z. K. & Peteshev, V. M. (1960). **[Changes in blood and urine from sheep and dogs with tick paralysis.]**—Trudy Inst. Zool. Akad. Nauk Kazakh. SSR **12**, 226-235. [In Russian.] **1843**

Larvae and nymphs of *Ornithodoros lahorensis* were allowed to feed on 5 sheep and 2 dogs. Between 180 and 1,273 ticks were placed on each animal. When the smaller numbers were used, fresh batches of ticks were applied after a week or so. Three sheep and one dog developed paralysis and died 21–26 days after the ticks were placed on them; one sheep and one dog became paralysed but recovered, and the remaining sheep did not become ill. Changes in blood picture and urine composition were followed.—R.M.

See also absts. **1714** (transmission of salmonella by flies and larvae); **1784** (role of arthropods in the transmission of F. & M. disease).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Fuhrimann, H. (1961). Studien zum Problem der Leberegelbekämpfung. **[Control of liver fluke.]**—Schweiz. Arch. Tierheilk. **103**, 88-98. [Summaries in English, French and Italian.] **1844**

The incidence of liver fluke infestation in slaughtered cows rose from 46·3% in 1955 to 62·6% in 1959 in Berne abattoir and from 55·2% to 68·6% in Basle abattoir. At Olten abattoir, in 1959 and 1960, liver damage resulting in the condemnation of at least 500 g./liver was found in 181 of 1,126 cattle. It was estimated that liver damage in cattle due to liver fluke infestation costs the Swiss economy 500,000 francs a year. Control and diagnosis were discussed.—M.G.G.

Zioło, T. (1960). Obserwacje histochemiczne nad rozmieszczeniem cholesterolu i witaminy C w korze nadnerczy owiec z marskością wątroby wywołaną motylicą wątrobową. **[Distribution of cholesterol and vitamin C in the adrenal cortex of sheep with cirrhosis of the liver due to fascioliasis.]** — Med. Wet., Warszawa **16**, 646-652. [In Polish. Summaries in English and Russian.] **1845**

Adrenals from 30 sheep with liver fibrosis and fascioliasis and from 30 normal sheep

were examined by histochemical techniques. In the affected animals the cholesterol and vitamin C levels were lowered in the zona fascicularis and zona reticularis, the fall being greater when the liver parenchyma was more damaged. The disappearance of cholesterol from the zona fascicularis and zona reticularis corresponded with the rise in its level in the zona glomerulosa.—M. GITTER.

Chock, Q. C., Davis, C. J. & Chong, M. (1961). **Sepedon macropus (Diptera: Sciomyzidae) introduced into Hawaii as a control for the liver fluke snail, Lymnaea ollula.**—J. econ. Ent. **54,** 1-4. [Authors' summary modified.] **1846**

Fasciola gigantica is the most important parasite of cattle in Hawaii. The intermediate host is the fresh-water snail, *Limnaea ollula.* Another snail, *Pseudosuccinea columella* acts as a vector under laboratory conditions. Both snails inhabit streams, paddies and swamps. The fly, *Sepedon macropus* was introduced in an attempt to control these snails.

Releases of *S. macropus* have been made on the five major islands, but to date recoveries of the fly have been reported only from Oahu and Kauai. In areas where establishment of the fly has occurred, usually half an hour of trapping will result in the capture of 50 to 100 flies, indicating the adaptability of this species. [There is no information about the effect of the flies on the snail population.—Ed.]

Boddeke, R. (1960). **The life history of Prosthogonimus ovatus Rudolphi. I. Experiments in birds. II. The intermediate hosts. III. Taxonomy and economical aspects.** — Trop. geogr. Med. **12,** 263-292, 363-377 & 378-387. **1847**

Starlings, jackdaws, a crow, chicks, adult fowls and ducklings were infected with cysts of *P. ovatus* from the dragon-fly *Cordulia aena* (second intermediate host). B. showed that several species described in different birds were host modifications of one species, *P. ovatus.* The first intermediate host was the snail *Bithynia tentaculata.*

Incidence of infestation in poultry and in dragon-flies in the Netherlands was discussed in Part I and in Part III the economic aspects were dealt with. Since White Leghorns appeared to be particularly susceptible to the harmful action of the trematode, B. suggested that they should not be kept in areas where the dragon-fly occurs. Rhode Island Reds were more resistant to the parasite. Infestation could result in the laying of soft-shelled eggs.—R.M.

Todorović, L. (1960). Problem ehinokokoze na području sreza Zrenjanin sa specijalnim osvrtom na njen ekonomski značaj. **[Echinococcosis in the Zrenjanin district of Yugoslavia.]** — Vet. Glasn. **14,** 983-988. [In Croat.] **1848**

In the Zrenjanin district with a population of 25,000 cattle, 105,000 pigs and 52,000 sheep, annual losses from echinococcosis were estimated at over 33 million dinar (about £40,000). Methods of control were discussed. —E.G.

Lamina, J. (1961). Die Capillaria-Arten der Hühner im Raume Süd-Hessen. **[Capillaria species in fowls in South Hesse, Germany.]** —Tierärztl. Umsch. **16,** 44-46. **1849**

Of 10,734 fowls examined over ten years, 1,371 were infested with capillaria species. Recently, incidence has increased and about one in every four fowls examined harboured these parasites. The majority were infested with *C. caudinflata,* then *C. retusa,* and the smallest porportion with *C. annulata.* Details were given of the morphology and biology of the worms, and of control by phenothiazine. —E.G.

Lukashenko, N. P. (1960). **[Microprecipitation on trichinella larvae as a test for infestation in pigs.]** — Helminthologia **2,** 105-110. [In Russian. Summaries in English, French and German.] **1850**

For each test 0·5 ml. of pig serum was added to 25 trichinella larvae on a microscope slide. A cover slip was applied and the slide was incubated at 37°C. If the serum contained trichinella antibodies a precipitate formed around the mouth of each larva, reaching its greatest extent after 18–24 hours of incubation. Sixteen experimentally infected pigs all gave positive tests between 31 and 135 days after infection, while many were positive 12, 17 and 21 days afterwards. Two pigs infected with *Ascaris,* two infected with *Trichocephalus* and 4 uninfected controls all gave negative tests.—R.M.

Reinecke, R. K. (1960). **The rôle of infested dung in the transmission of nematode parasites of cattle.**—J. S. Afr. vet. med. Ass. **31,** 45-52. **1851**

R. describes the development and survival of the eggs and larvae of the gastro-intestinal nematodes of cattle in dung on the veld. Rate

of development is influenced by weather, temperature and moisture being the most important. Moisture also controls survival in the dung and escape of the infective larvae from it. In cattle pens there is a great concentration of dung, particularly in semi-arid areas in which cattle come daily to the pens for water. Under dry conditions the dung in the pens is practically free from larvae but in the rainy season it becomes a culture medium and heavy larval populations develop. Such pens are highly dangerous and calves become heavily infested.

The following suggestions were made for control. All yards, pens and byres should have concrete floors which are cleaned daily. Three or four calf paddocks should be provided and grazed in rotation, as soon as rain falls after a dry period; segregation of calves, weaners and cows should minimise infection of calves by older animals. Management of the calves is facilitated by set breeding seasons: serving of cows between Feb. 1st and April 30th for the summer calf crop, cows not conceiving at the first service being served again between August 14th and October 15th. The recommendations have been shown to be effective under field conditions in S. Africa.

Details of the experimental work reported here are given in *Onderstepoort J. vet. Res.* **28,** 365–464 ("A field study of some nematode parasites of bovines in a semi-arid area, with special reference to their biology and possible methods of prophylaxis".)—T. E. Gibson.

Dewhirst, L. W. & Hansen, M. F. (1961). **Methods to differentiate and estimate worm burdens in cattle.**—Vet. Med. **56,** 84-89. **1852**

Methods for faecal egg counts, larval differentiation, and total worm counts in cattle are described. The different types of worm eggs found in cattle faeces are illustrated. Eggs of *Bunostomum, Trichuris, Nematodirus,* and *Strongyloides* as well as *Moniezia* are easily recognized but those of other trichostrongylids are not. It is suggested that they can be readily classified into two groups one including eggs of *Haemonchus* and *Cooperia,* the other eggs of *Trichostrongylus, Oesophagostomum,* and *Cooperia.* For full species identification faecal cultures must be prepared and the larvae identified. A nomogram is given enabling this to be done after taking three measurements of each larva by means of the eyepiece micrometer. For the estimation of total worm count the intestinal contents are made up to a volume of 50 quarts from which a quart sample is removed whilst the whole is being agitated using an agitator washing machine. The worms in the quart sample are counted and a formula is given for the calculation of the number of samples which must be examined to give any desired degree of confidence. A table of differential worm counts is given from which worm egg ratios for the different species of worm have been derived.—T. E. Gibson.

Kates, K. C., Turner, J. H., Lindahl, I., Whitmore, G. E. & Enzie, F. D. (1960). **Effectiveness of three management systems on parasitism in lambs. I. Clinical effects of parasitisms relative to exposure and medication.** —J. Parasit. **46,** No. 5 Sect. 2 p. 40. **1853**

Turner, J. H., Kates, K. C., Lindahl, I., Whitmore, G. E. & Enzie, F. D. (1960). **Effectiveness of three management systems on parasitism in lambs. II. Kinds and levels of parasitism relative to exposure, medication, and weather.**—Ibid. pp. 40-41. **1854**

Enzie, F. D., Colglazier, M. L., Whitmore, G. E. & Thompson, D. E. (1960). **Effectiveness of three management systems on parasitism in lambs. III. Resistance of Haemonchus contortus to phenothiazine.** — Ibid. p. 41. **1855**

I, II & III. Three groups, each of over 100 lambs, were reared under different conditions from March to September. One group kept in a yard grew quickly and had a very low degree of parasitism. The second group moved every 2 weeks on to "clean" pasture grew more slowly and acquired moderate *Haemonchus contortus* infestation by midsummer (about 600 worms per lamb) and moderate to high *Strongyloides papillosus* infestation (about 13,000 per lamb) in August and September. The third group moved every 2 weeks on to contaminated pasture acquired severer infestations than the second group (13,000 *H. contortus* and 20,000 *S. papillosus* per lamb), with cases of acute anaemia and a mortality of 9%. Weather conditions during the trial favoured both infestations. All 3 groups had continuous access to a phenothiazine-salt mixture, and those on pasture were dosed with phenothiazine and copper sulphate. *S. papillosus* infestation was unaffected by treatment, and the response of *H. contortus* infestation was unsatisfactory, Resistance to phenothiazine was demonstrated in this strain of *H. contortus.*—M.G.G.

Forsyth, B. A., Scott, M. T. & Bainbridge, J. R. (1961). **Phenothiazine. I. The effect**

of purity and "dose area" on its anthelmintic efficiency in sheep.—Vet. Rec. **73,** 67-74 & 75. [Authors' summary modified.] **1856**

Evidence is presented that the anthelmintic efficiency of phenothiazine in sheep improves with increasing purity. The activity of phenothiazine of 85% purity and above is generally good. When purity falls below 85% the efficiency becomes rather low and also unduly variable.

The effect of particle size is also demonstrated, but it is considered that this is best expressed in terms of "dose area"—a product of dose in grammes and fineness measured by specific surface area in sq. cm. per g. Higher "dose areas" gave greater efficiency than lower "dose areas," but it did not appear to matter whether a given "dose area" was obtained by a small weight of finely ground material or a larger weight of coarsely ground material. At the same dose weights finely ground formulations were better than coarsely ground formulations.

By calculation, it appears that for an anthelmintic efficiency of 90% a "dose area" of 185,000 sq. cm. with phenothiazine of 85% purity or 155,000 sq. cm. with phenothiazine of 90% purity is necessary.

Ross, C. V. & Karr, M. R. (1960). **Phenothiazine versus methylphosphoramidate as an anthelmintic for lambs.**—J. Anim. Sci. **19,** No. 4. p. 1313 of Proceedings. **1857**

In three field experiments to compare phenothiazine with 4-tertbutyl-2-chlorophenyl methyl methylphosphoramidate (Ruelene), the dose of phenothiazine was 15 g. per sheep and of ruelene 100, 150 and 200 mg. per kg. In the first experiment one treatment with each drug was given, in the others two at a 28 day interval. In all experiments the lambs treated with ruelene had lower faecal egg counts and greater weight gains than those treated with phenothiazine, but in only one experiment were the differences statistically significant.

—T. E. Gibson.

Douvres, F. W. (1960). **I. The in vitro cultivation of some gastrointestinal nematodes of cattle and sheep. II. Influence of intestinal extracts and sera from cattle infected with Oesophagostomum radiatum on the in vitro cultivation of this nematode: preliminary report.**—J. Parasit. **46,** No. 5 Sect. 2 pp. 25-26. **1858**

These abstracts from the proceedings of the American Society of Parasitologists state that larvae of *Oe. radiatum, Ostertagia, Haemonchus contortus* and *Cooperia* spp. have been induced to develop to the third or fourth larval stages within 7–42 days of incubation in defined media. [See also *V.B.* **31,** 824.]

—R.M.

Krivoshta, E. E. (1960). **[Ditrazin phosphate in nematodiriasis of sheep.]**—Helminthologia **2,** 95-97. [In Russian. Summaries in English, French and German.] **1859**

Diethylcarbamazine phosphate (ditrazin phosphate) was inj. s/c as a 1 : 3 aqueous soln. into 28 naturally infested sheep. The dosage was 0·1 or 0·2 g./kg. body wt., repeated the next day. Results were assessed by examination of faeces. Eggs were absent from the faeces of 26 of the sheep for at least 34 days after treatment.—R.M.

Leland, S. E., Jr., Drudge, J. H., Wyant, Z. N. & Elam, G. W. (1961). **Studies on Trichostrongylus axei (Cobbold, 1879). VII. Some quantitative and pathologic aspects of natural and experimental infections in the horse.**—Amer. J. vet. Res. **22,** 128-138. **1860**

The lesions in horses experimentally infected with *T. axei* are compared with those in naturally infected horses. In experimental animals the initial lesion, hyperaemia of the stomach, was followed by lymphocytic and catarrhal inflammation and necrosis and erosion of the mucous membrane. The final result was chronic proliferative inflammation. All stages may be seen in the same animal and the lesions seen in natural infections are similar. The pathogenesis was discussed. The prepatent period was 23·5 days, a little longer than in calves or sheep.—T. E. Gibson.

Mitskevich, V. Y. (1960). **[Elaphostrongylus rangiferi, a new nematode inhabiting the cerebral meninges of reindeer.]**—Trudy Inst. Zool. Akad. Nauk Kazakh. SSR **12,** 115-119. [In Russian.] **1861**

Five adult nematodes were found under the pia mater of a reindeer. It was shown by experimental infection that their larvae were often present in reindeer faeces. This paper describes the new species, and does not discuss its action on the host.—R.M.

Zajíček, D. (1960). Příspěvek k druhovému výskytu a patogenitě vlasovek rodu Amidostomum Railliet et Henry 1909 (Nematoda). **[Incidence and pathogenicity of Amidostomum species in domestic and wild aquatic birds.]**—Sborn. čes. Akad. zemědělsk. Věd,

vet. Med. **5,** 775-788. [In Czech. Summaries in German and Russian.] **1862**

Of an unstated number of geese 59% harboured the stomach worm *Amidostomum anseris*: of mallards 11·8% and of domestic ducks 3·8% harboured *A. boschadis,* and of coots 38·4% harboured *A. fulicae.* The parasites were host-specific but *A. boschadis* was transmissible from mallards to domestic ducks. The morphology of the parasites is described.—E.G.

Tsvetaeva, N. P. (1960). **[Lesions in the proventriculus of ducks experimentally infected with Tetrameres fissispina.]**—Helminthologia **2,** 143-150. [In Russian. Summaries in English, French and German.] **1863**

These nematodes inhabit and destroy glands of the proventriculus. T. suggested that the damage could be sufficient to interfere with digestion, and this may explain the emaciation of infested birds. [6 photomicrographs.]—R.M.

Grégoire, C. & Pouplard, L. (1961). Bronchite vermineuse et rotation. Résultats d'expérience. **[Parasitic bronchitis and pasture rotation: results of further experiments.]**—Ann. Méd. vét. **105,** 3-7. **1864**

From April to September, 26 cattle were moved on 9 pasture plots in rotation, spending 4 days on each plot. There were no clinical symptoms of parasitic bronchitis, apart from coughing in 2 animals towards the end of June, and the average weight gain was 145·5 kg. All of 14 control cattle on one pasture developed severe parasitic bronchitis, and the average weight gain from June to September was only 50·3 kg.—M.G.G.

van Eck, G., Kruize, J., Paul, S., Reinders, J. S. & Wilson, J. H. G. (1960). Indrukken van en ervaringen met de vaccinatie van kalveren tegen longworminfecties. **[Experience of vaccination of calves against lungworm infections.]** — Tijdschr. Diergeneesk. **85,** 1089-1101. [In Dutch. Summaries in English, French and German.] **1865**

Vaccine prepared in the Netherlands consisted of a suspension of 1,000–1,500 X-irradiated third-stage larvae of *D. viviparus* in 20 ml. water. It was given by mouth and was repeated six weeks later. Vaccine was given to 708 calves on 75 infected farms between the end of April and the beginning of June. Examination of faeces and complement-fixation tests on serum were done on some animals between September and October. Although the incidence of husk was generally low on unvaccinated farms that year, the results were regarded as very satisfactory.

The question of the occurrence of non-verminous respiratory disease was discussed, with reference to "cuffing pneumonia" on one farm where vaccinated and unvaccinated calves were affected.—R.M.

Breza, M. & Murár, J. (1960). O možnosti použitia p-brómfenylizotiokyanátu (p-BrFITK) pri müllerióze oviec. **[Use of p-bromophenyl isothiocyanate against Muellerius capillaris in sheep.]**—Folia vet., Košice **4,** 251-260. [In Slovak. Summaries in English, German and Russian.] **1866**

Seven old, emaciated lungworm-infested sheep were given single oral doses of 0·15 g./kg. body wt. of *p*-bromophenyl isothiocyanate. Within a few days *Muellerius capillaris* larvae disappeared completely from the faeces of four and in the remainder their numbers were considerably reduced. In three other sheep s/c doses of 0·5 ml. of a 20% soln. of the drug in olive oil, equal to 0·1 g./kg. body wt., proved ineffective. The drug was well tolerated. Given orally, it was also effective against strongyles but apparently not against flukes. Further trials of this drug, alone or in combination with cyanacethydrazide, are contemplated.—E.G.

Ewing, S. A., Todd, A. C. & Dorney, R. S. (1960). **Efficacy of cyanacethydrazide against swine lungworms.**—J. Amer. vet. med. Ass. **137,** 654-657. **1867**

Ten pigs experimentally infected with lungworms were given cyanacethydrazide on the 55th, 59th and 75th days after infection. The drug was administered subcutaneously at the rate of 15 mg./kg. body wt. No effect on worm burden or weight gains was demonstrated.—J. F. Michel.

Fitzsimmons, W. M. (1961). **Bronchostrongylus subcrenatus (Railliet & Henry, 1913) a new parasite recorded from the domestic cat.** — Vet. Rec. **73,** 101-102. [Author's summary modified.] **1868**

This records the first occurrence in the cat of the lungworm *Bronchostrongylus subcrenatus* hitherto only recorded from leopards and tigers. A brief account of its systematics and life-history is followed by a short description and a note on its differentia-

tion from a similar lungworm of the domestic cat. The lungworms were collected from a cat in Blantyre, Nyasaland.

Hiepe, T. (1961). Beiträge zur medikamentellen Askaridenbekämpfung. I. Über die Anwendung von Piperazinchlorhydrat gegen den Spulwurmbefall bei Equiden. [**Anthelmintics against Ascaris. I. Use of piperazine hydrate against ascaris infestation in horses and zebras.**]—Mh. VetMed. **16,** 15-19. **1869**

Oral doses of 5 g./50 kg. body wt. of piperazine hydrate were highly effective against ascaris infestation in 63 horses and 3 zebras.—E.G.

Zendulka, M. (1960). Změny v organismu selat vyvolané migrací larev Ascaris suum Goeze. [**Lesions in piglets caused by migrating Ascaris larvae.**] — Věd. Práce Ustavu vet. Brno **1,** 227-273. [In Czech. Summaries in German and Russian.] **1870**

It was shown experimentally in 33 piglets 4–10 weeks old, that interstitial chronic eosinophilic hepatitis was associated with migrating ascaris larvae. Piglets were infected with oral doses varying from 4,000–3 million embryonated ova. Eight hours after feeding, larvae passed through the mucous membranes of the digestive system, producing minute haemorrhages, and in the case of massive doses, oedema. Larvae were also present in lymph nodes, particularly in those of the caecum and the large intestine. Within 5 days focal lesions became apparent in the liver, characterized by whitish spots of varying size. In the lungs migrating larvae may exacerbate chronic bronchopneumonia. Details of experimental infestation in mice, g.pigs and rabbits are also given.—E.G.

Taffs, L. F. (1960). **Immunization of guinea-pigs against Ascaris suum.**—J. Helminth. **34,** 347-348. [Author's introduction modified.] **1871**

It has been shown that g.pigs can be protected against re-infection by the subcutaneous inoculation of embryonated *Ascaris* eggs [*V.B.* **27,** 3051]. This communication reports immunization by the intravenous inoculation of third stage larvae.

Poláková, M. & Lebduška, J. (1960). Další zkušenosti s léčbou askaridiosy drůbeže hromadným podáváním piperazinu. [**Mass treatment of Ascaridia infestation in fowls with piperazine.**]—Věd. Práce Ustavu vet. Brno **1,** 133-170. [In Czech. Summaries in German and Russian.] **1872**

In the treatment of *Ascaridia galli* infestation in fowls, a 1% aqueous soln of piperazine adipate or piperazine citrate, given as drinking water, proved superior to a 2% soln. To ensure that the birds receive the effective dose of the drug, which is 0·5 g./kg. body wt., water should be withheld before treatment. Details are given of treatment in 6,962 fowls, in about half of which the efficacy of the anthelmintics was confirmed by faecal examination. The 1% soln. expelled on the average 99·8% of the worm burden from 3,350 fowls. About 96·5% of the birds were completely freed from the parasites.—E.G.

Siegmann, O. (1960). Legehennen im Feldversuch mit Hygromycin als Anthelminthicum. [**Field trial of hygromycin as an anthelmintic in laying hens.**] — Dtsch. tierärztl. Wschr. **67,** 672-676. [Summary in English.] **1873**

Half of a flock of 1,400 fowls was treated for 54 days with 0·25% "Hygromix" in the food (= 12,000 units of hygromycin per kg. of food). P.M. findings in 114 birds that died before or during treatment and 247 that were killed after treatment revealed almost complete elimination of *Heterakis* and *Ascaridia,* but no effect on *Capillaria columbae* or coccidia. At the end of the trial the egg yield of treated hens was higher than that of untreated hens.—M.G.G.

Lebduška, J. & Poláková, M. (1960). Použití drůbeže ke zkoušení nových anthelmintik. [**Evaluation of new anthelmintics in fowls.**] —Věd. práce Ustavu vet. Brno **1,** 87-98. [In Czech. Summaries in German and Russian.] **1874**

A technique for the evaluation of anthelmintics in fowls is described. Fowls heavily infested with *Ascaridia* were kept in cages with wire mesh floors allowing droppings to fall onto a sheet of glass. One half of the birds received the maximum tolerated dose of the anthelmintic under test, the other half a therapeutic dose of a standard anthelmintic such as piperazine adipate or citrate. Expelled worms were counted daily. Four to seven days after expulsion of worms had stopped, both groups were given doses of 1·5 g./kg. body wt. of piperazine and expelled worms, if any, counted over the next four days. Since it was assumed that the two doses of piperazine expel practically 100% of the worm

burden, it was possible to express efficacy of the anthelmintic under test by the percentage of worms expelled and the percentage of birds completely freed from worms. In testing the efficacy of an anthelmintic against cestodes or *Heterakis,* the number of retained worms must be determined by P.M. examination.
—E.G.

Schebitz, H. (1960). Eine durch Thelazia lacrimalis beim Pferd verursachte Conjunctivitis ulcerosa. **[Ulcerative conjunctivitis in a horse caused by Thelazia lacrimalis.]**—Dtsch. tierärztl. Wschr. **67,** 564-567. [Summary in English.] **1875**

An illustrated account of a case seen at the Cairo veterinary faculty.—R.M.

Venkataratnam, A. & Kershaw, W. E. (1961). **The distribution of microfilariae of Onchocerca spp. in the cow.**—Trans. R. Soc. trop. Med. Hyg. **55,** 4-5. **1876**

Portions of skin from the ears, forelegs, brisket, abdomen and thigh of over 100 cattle were examined for microfilariae at the Liverpool abattoir. In 3 carcasses in which adult worms were found only in the neck, microfilariae were recovered from the skin of the ears and neighbouring parts of the trunk, and in one in which worms were found in the neck and abdomen, microfilariae were recovered from the ears and trunk. But of 16 with worms only in the abdomen, 11 had no microfilariae in the ears, although they were present in the trunk.—M.G.G.

Rothstein, N., Kinnamon, K. E., Brown, M. L. & Carithers, R. W. (1960). **Canine microfilariasis in Eastern United States.** — J. Parasit. **46,** No. 5 Sect. 2 p. 28. **1877**

Microfilariae in 244 (41%) of 600 dogs in Alabama, 31 (5%) of 649 dogs in Pennsylvania, and 2 of 69 dogs in Rhode Island were *Dirofilaria immitis, Dipetalonema* sp. and, in 4 dogs, a third type shorter and wider than *Dipetalonema.* There was no variation in the incidence of *Dirofilaria,* but *Dipetalonema* was 15 times more frequent in Alabama than in the North.—M.G.G.

Ershov, V. S. (1960). **[Immunization of farm animals against helminths, with special attention to Ascaris in piglets, Ascaridia in chicks, Moniezia and Fasciola in lambs.]** — Trudy Inst. Zool. Akad. Nauk Kazakh. SSR **12,** 96-103. [In Russian.] **1878**

Immunity in animals inoculated with helminth antigens, such as *Moniezia* and *Fasciola,* only lasted about 6 weeks. Active immunization against ascarids and *Fasciola* only protected 10–28% of the animals from infestation. Anthelmintics offered much better prospects for the control of helminths.
—R.M.

Vražići, O. & Rijavec, M. (1960). Prilog poznavanju parasitske faune magarca (Equus asinus L.). **[Parasitic fauna of the donkey.]** —Vet. Arhiv. **30,** 128-133. [In Croat. Summaries in English and German.] **1879**

Of 82 donkeys examined in Yugoslavia, 2 harboured *Dicrocoelium dendriticum,* 7 *Fasciola hepatica,* 13 *Ascaris equorum,* 19 each *Oxyuris equi* and *Setaria equina,* 12 *Habronema* spp., 22 *Gongylonema pulchrum,* 21 *Trichonema* spp., 9 *Cylicocyclus* spp., 3 each *Strongylus equinus, Delafondia vulgaris, Triodontophorus serratus, Petrovinema poculatum, Poteriostomum skrjabini, Dictyocaulus arnfieldi* and 6 *Cylicodontophorus* spp. Fifty were infested with *Ixodes ricinus, Dermacentor silvarum, Hyalomma dromedarii, Rhipicephalus bursa, Bovicola equi* and *Haematopinus asini. Gasterophilus pecorum* larvae were present in 59, *G. intestinalis* in 50 and *G. veterinus* in 18.—E.G.

McTaggart, H. S. (1960). **Helminths from the alimentary canal of farm mink in Britain.**—J. Helminth. **34,** 247-258. [Author's summary and conclusions modified.] **1880**

The gastro-intestinal tracts of 200 mink from 42 farms were examined for helminth parasites.

No parasites were found in the stomach but two species of fish-borne parasite were found in the intestine.

Infestation with the trematode *Cryptocotyle lingua* was found in 12 mink; the largest number recovered from one mink was seven.

Single immature specimens of the acanthocephalid *Corynosoma hadweni* were recovered from 4 mink, but it is considered that these were not instances of true parasitism.

Helminth parasites do not seem to be an important hazard on mink farms in Gt. Britain.

See also absts. **1821** (earthworms as carriers of Newcastle disease); **2030** (book, helminthoses of domestic birds).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Kronberger, H. (1960). Spontane Geschwülste bei Haussäugetieren. Nach den Sektionsprotokollen des Veterinär-Pathologischen Institutes. **[Spontaneous tumours in domestic mammals.]**—Mh. VetMed. **15,** 730-735. **1881**

From 1917 to 1959, 832 tumours were found in 25,709 domestic mammals examined at the Veterinary Pathological Institute, Leipzig: 22 (2·7%) of 814 horses, 2 (0·3%) of 648 cattle, 5 (0·3%) of 1,518 sheep, 2 (0·4%) of 529 goats, 2 (0·03%) of 6,953 pigs, 743 (7·8%) of 9,538 dogs, 48 (1·7%) of 2,862 cats and 8 (0·3%) of 2,847 rabbits. The ratio of sarcoma to carcinoma was 1 : 1 in horses, 1 : 1·6 in dogs, 1 : 1·5 in cats, and 1 : 2·5 in rabbits. The average age of the dogs with tumours was distinctly higher than that of 2,000 dogs that had died from other causes. Dogs with carcinoma tended to be older than those with sarcoma. The commonest site in dogs was the liver (22%), followed by the mammary gland (11·7%), lung (7·7%), thyroid gland (7·4%), skin (6·2%) and bone (5·4%). In cats also the liver was the most frequent site (29·2%), followed by the lung (18·7%), mammary gland (14·6%) and skin (10·4%).—M.G.G.

Überreiter, O. (1960). Neubildungen bei Tieren. **[Neoplasms in animals.]** — Wien. tierärztl. Mschr. **47,** 805-832. [Summaries in English, French and Italian.] **1882**

Details are listed in 15 tables of 4,848 neoplasms in dogs, horses, cats and birds seen at the Vienna veterinary college during the periods 1923–43 and 1950–59.—E.V.L.

Albright, J. L. (1960). **Multiple lipomatosis in dairy cattle.**—J. Hered. **51,** 231-236. **1883**

Details were given of multiple lipomatosis in 22 Holstein-Friesian cattle. The disease was first observed in animals 3½ years old and with age it became progressively worse. There was no record of malignancy developing. The condition appeared to be hereditary, due to a dominant gene with incomplete penetrance. —E.G.

Jabara, A. G. (1960). **Canine mammary carcinomata.**—Aust. vet. J. **36,** 389-398. **1884**

Twenty spontaneous canine mammary carcinomata are described and relevant literature is reviewed.—N. Wickham.

Kasbohm, C. & Lettow, E. (1961). Kasuistik intraabdominaler "Tumoren" beim Hund. **[Intra-abdominal tumours in dogs.]** — Berl. Münch. tierärztl. Wschr. **74,** 34-35. [Summary English.] **1885**

Of 81 intra-abdominal neoplasms in dogs 29 were in the liver, 7 in the spleen, 15 in the ovaries, 6 in the uterus, 3 in the kidneys, 2 in the bladder, 2 in the adrenals, one in the intestine and one in the stomach.—E.G.

Allen, F. M., Kaplan, M. M., Meranze, D. R. & Gradess, M. (1960). **Treatment of spontaneous tumours by temporary local ligation. A comparative study in dogs.**—Bull. World Hlth Org. **23,** 727-737. [Summary in French.] **1886**

This study was designed to obtain further evidence that temporary occlusion of the entire blood supply by ligation exerted a specific effect on spontaneous tumours as contrasted with normal tissue. As test subjects, 49 spontaneous accessible tumours of dogs were treated by temporary ligation for periods of 4 to 11 hours. Total tumour necrosis was achieved with 29 of the 41 benign tumours, and with all of the 8 malignant tumours. There was a relatively high mortality rate, as 12 of the dogs died (one from an accident), possibly due to the poor surgical risks the animals were considered to be at the time of treatment. No statement about the permanency of "cure" could be made, owing to the limited periods of observation. The usual course in "cures" was that "after the temporary ligature was released, oedema and inflammation began immediately in the ligated area. Gross softening and necrosis of the tumour occurred within periods varying from several hours to several days, the more malignant tumours . . . responding earliest . . . The necrotic material exuded either through openings already present in the skin or through the biopsy wound for a period of days. Healing with scar formation then occurred over a period of 2–4 weeks".

The theoretical and practical significance of these observations is discussed. —E. Cotchin.

Hilliger, H. G. (1961). Analytische Untersuchungen von Seren haematologisch für Leukose positiver Rinder mittels der Ultrazentrifuge. **[Analysis by ultracentrifugation of serum from cattle with leucosis.]**—Dtsch.

tierärztl. Wschr. **68,** 76-80. [Summary in English.] **1887**

There were no appreciable differences in serum samples from eight cattle suspected of leucosis and those from clinically and haematologically normal cattle, when examined by ultra centrifugation-sedimentation. Electrophoretic analysis of serum proteins conformed with results obtained by others.—E.G.

Niemand, H. G. (1960). Zur Leukämie des Hundes und ihrer Therapie. **[Leucosis in dogs and its treatment.]**—Kleintier-Praxis **5,** 105-106 & 130-141. [Summaries in English and French.] **1888**

N. described the different forms of leucosis in dogs, clinical picture and differential diagnosis. It appears to be precipitated by disease processes, especially those affecting protein metabolism. Of 29 cases, 4 developed in dogs with pyometra, one in a tuberculous animal, and one after a pregnancy. The most suitable drugs appear to be potassium arsenite soln. in the initial stages of the disease and triethylenethiophosphoramide with prednisone and prednisolone in advanced cases.—M.G.G.

Darcel, C. le Q. (1961). **Avian erythroblastosis. III. Some hematological observations bearing on the increased iron turnover.**—Canad. J. comp. Med. **25,** 19-23. [Author's summary modified.] **1889**

Haematocrit values, whole blood haemoglobin and iron levels were found to decline in advanced erythroblastosis. Although protein bound haemoglobins could be detected in small amounts using paper electrophoresis, there was no marked elevation of plasma haemoglobin, plasma iron or serum bilirubin. Increased amounts of porphyrin were found in plasma from birds with erythroblastosis. A haemolytic syndrome affecting mature erythrocytes is therefore unlikely in the development of erythroblastosis, and the possibility of 'haem diversion' or the increased destruction of precursor cells has to be considered. The need for further studies of the fate of injected iron is emphasized.

NUTRITIONAL AND METABOLIC DISORDERS

Gorišek, J. (1960). O procesu zgrušavanja krvi i o kalciju u krvi i mokraći kod bolesti uzrokovane lišćem šećerne repe. **[Blood coagulation and calcium content of blood and urine in cows fed sugar-beet leaves.]**—Vet. Arhiv **30,** 300-306. [In Croat. Summaries in English and French.] **1890**

G. studied prothrombin levels in blood, and calcium levels in blood and urine in 40 cows, kept on a diet of sugar beet tops for 44 days. In 32 cows prothrombin content fell, in one to only about 60% of the normal value. After restoration of a conventional diet, prothrombin levels became normal within 5 days. None of the cows developed haemorrhagic diathesis in the course of the experiment. A decrease in blood calcium was observed in 23, and in urine calcium levels in 34 cows. There appeared to be no relationship between the prothrombin and calcium content, since the blood calcium content in one cow with a low prothrombin level was normal.—E.G.

Wright, P. A. (1960). **Infertility in rabbits induced by feeding Ladino clover.** — Proc. Soc. exp. Biol., N.Y. **105,** 428-430. [Author's summary modified.] **1891**

Feeding Ladino clover to female rabbits impaired reproductive performance, infertility being complete when clover was fed both before and during pregnancies. Cause is unknown but failure of ovulation and implantation was observed, and evidence indicates that infertility may be unrelated to oestrogenic content of the clover.

Clarkson, T. B. & Lofland, H. B. (1961). **Effects of cholesterol-fat diets on pigeons susceptible and resistant to atherosclerosis.**—Circulat. Res. **9,** 106-109. **1892**

Pigeons of the White Carneau breed developed atheromatous lesions complicated by connective tissue proliferation, but auto-sexing Kings and Racing Homers developed merely 'pure atheroma' or 'fatty streaks'. Serum cholesterol content was similar in all three breeds.—R.M.

Cohn, C., Pick, R. & Katz, L. N. (1961). **Effect of meal eating compared to nibbling upon atherosclerosis in chickens.**—Circulat. Res. **9,** 139-145. **1893**

Birds aged 8–10 weeks were allowed either free access to food day and night ("nibblers") or only for one or two hours each day ("meal eaters"). Both groups were fed a diet known to induce atherosclerosis. The meal eaters developed double the serum

cholesterol content and seven times the severity of coronary atherosclerosis as the nibblers.
—R.M.

Bosticco, A. & Corrias, A. (1960). Influenze delle carenze e degli squilibri minerali sulla mortalità embrionale precoce, sull'anaestro e sul subestro delle bovine nelle zone di risaia del vercellese e del novarese. **[Mineral deficiency and imbalance as causes of infertility in cattle.]** — Vet. ital. **11,** 929-945. [Summaries in English, French and German.] **1894**

In the rice-growing areas of Piedmont infertility is a serious problem affecting over 60% of the cows. The primary causes are TB., brucellosis and nutritional imbalance. The various factors contributing to nutritional deficiency are discussed. The soil is acid with low humus and very low calcium content. Analysis of hay and other fodders revealed serious calcium deficiency and a less marked deficiency in copper and zinc. Ca/P and Ca/Mg ratios were abnormal. During spring, summer and autumn the animals are fed exclusively on green fodder with an excess of proteins and a deficiency of roughage and mineral matter. During 10 years common disorders of the genital system encountered in over 3,000 cows were early foetal death (30–38%), secondary ovarian hypoplasia, anoestrus and, less frequently suboestrus, delayed ovulation and secondary inflammatory processes. Treatment consists in the use of suitable fertilizers for the soil and inclusion of mineral supplements in the diet.—T.E.G.R.

Gentile, G. & Venturoli, M. (1960). Modificazioni elettrocardiografiche da carico di potassio nel cavallo. **[Electrocardiographic changes caused by high blood potassium content in the horse.]** — Nuova Vet. **36,** 167-174. [Summaries in English and French.] **1895**

In 8 horses with artificially increased blood potassium content the electrocardiographic changes were similar to those in man and experimental animals though they appeared at relatively lower potassium levels.
—T.E.G.R.

Taylor, C. R. & Stevens, A. G. W. (1960). **Investigation into animal ill thrift on Rotomahana "mud" country, Rotorua.**—N.Z. J. Agric. **101,** 546-550. **1896**

An investigation was made into unthriftiness in calves and low yield in cows in an area of fine soil of volcanic origin rich in Ca, K and Mb, but requiring P. For 4 years one farm in the area was managed under the direction of the New Zealand Dept. of Agriculture. Trials excluded Co and Cu deficiency, but a group of 12 calves drenched fortnightly with 10 mg. Se maintained normal growth while 12 controls lost condition for 2 months after heavy rain had induced a flush of pasture growth in late summer. As the general health and production of the animals on the farm improved during the 4-year period, it was concluded that poor pasture management and understocking, leading to rank growth and unbalanced development of pasture species, were the cause of the unthriftiness. Further trials will be made with Se and Se plus Cu.
—M.G.G.

Kolb, E., Gürtler, H., Schimmel, D. & Seidel, H. (1961). Eisenstoffwechsel und Eisenmangelanämie, unter besonderer Berücksichtigung der Verhältnisse bei Ferkeln und Kälbern. **[Iron metabolism and iron deficiency anaemia in piglets and calves.]**—Mh. VetMed. **16,** 81-88. **1897**

Essential factors in haemoglobin synthesis in young animals, apart from iron, are Cu, Co, Mn, pyridoxine, folic acid, vitamin B_{12}, and of the essential amino-acids mainly lysine. The role of nutrition of the dam, access to pasture of the young and iron dextran therapy in anaemia of piglets and calves was discussed.
—E.G.

Hoorens, J. (1960). Invloed van ijzerchelaat bij binnen-opgefokte biggen. **[Influence of chelated iron on pigs reared indoors.]** — Vlaams diergeneesk. Tijdschr. **29,** 247-254. [In Flemish. Summaries in English, French and German.] **1898**

H. tried a proprietary chelated iron preparation. A tablet was stated to be composed of 350 mg. iron aminoate (equivalent to 35 mg. Fe) and 1 mg. aneurine. 109 piglets in 11 litters were each given one tablet at 2, 8 and 15 days of age. Haemoglobin and erythrocyte values and weight gain were better in treated pigs than in controls. The response was similar to that obtained in an earlier trial [*Vlaams diergeneesk. Tijdschr.* **28,** 73–79] in which iron dextran was injected into pigs 2 weeks old.—R.M.

Matrone, G., Thomason, E. L., Jr. & Bunn, C. R. (1960). **Requirement and utilization of iron by the baby pig.**—J. Nutr. **72,** 459-465. [Authors' summary modified.] **1899**

The minimum iron requirement of baby pigs, fed fortified cows' milk, up to 60 days

of age was approx. 60 p.p.m. of the dry matter intake. Utilization of the iron at the minimum requirement level was approximately 30%. Making baby pigs anaemic (about 6 g. Hb/100 ml. blood) by depleting them of iron before initiating iron feeding did not increase iron utilization. Specific activity data of blood, liver, spleen, kidney and bone marrow suggested that at the critical end of iron deficiency, tissue iron needs took precedence over haemoglobin iron need. Once this minimum tissue need was met, absorbed iron appeared to be incorporated directly into haemoglobin without equilibrating with tissue iron.

Tammemagi, L. & Newton, L. G. (1960). **Iron supplementation in piglet anaemia.** — Qd J. agric. Sci. **17,** 97-106. **1900**

Of 111 piglets in 14 litters, 30 received iron and ammonium citrate by mouth, 57 iron-dextran intramuscularly, and 24 were controls. Under the conditions of management (concrete pens with no access to soil) the blood haemoglobin fell within 4 days of birth by 30% and reached its lowest level by the second or third week. The most commonly noted evidence of iron deficiency was diarrhoea. Oral treatment with iron and ammonium citrate was less effective than the injection of iron-dextran in restoring haemoglobin levels. The authors advocate the use of iron-dextran in piglet anaemia because of ease of administration, rapidity of response and the necessity for one treatment only.

—W. L. Hindmarsh.

Gabriš, J. & Brezány, D. (1960). Príspevok k možnosti ovplyvnenia krvného obrazu anemických prasiatok parenterálnym podaním krvného sedimentu. [**Influence of parenteral application of blood sediment on the blood picture in anaemic piglets.**] — Folia vet., Košice **4,** 279-287. [In Slovak. Summaries in English, German and Russian.] **1901**

The author studied the blood picture in 45 piglets in the early stages of anaemia and in 44 controls, 11–12 days old, after two i/m doses at an interval of 7 days of sediment formed in citrated blood from healthy pigs, kept for 2–3 days at 2° to 4°C. There was an increase in the haemoglobin content and the number of red corpuscles. Increase in leucocytes was less marked. Condition of piglets improved generally, diarrhoea ceased and there were moderate weight gains.—E.G.

Lease, J. G., Barnett, B. D., Lease, E. J. & Turk, D. E. (1960). **The biological unavailability to the chick of zinc in a sesame meal ration.**—Poult. Sci. **39,** 1269. **1902**

Chicks developed symptoms resembling those of zinc deficiency on a semi-purified ration containing 52 p.p.m. zinc with sesame meal as a source of protein. Addition of 60–120 p.p.m. zinc or EDTA to the ration reduced the symptoms.—M.G.G.

Konstantinov, A. (1960). **Pathology of vitamin A deficiency in pigs.** — Izv. Inst. Pat. Zhivotni, Sofia **8,** 37-51. [In Bulgarian. Summaries in German and Russian.] **1903**

In an experiment lasting 34 months, 2 male and 3 female pigs and their offspring (total 35 pigs) were fed continuously on a diet almost free from vitamin A. Typical symptoms of vitamin A deficiency developed and the pigs died or were killed for examination between 12 and 21 months after onset of symptoms. In advanced cases there were numerous necrotic patches in tonsils, oesophagus, conjunctiva and renal papillae, while epithelial cornification was found in the urinary tract. Sucking pigs developed catarrhal or haemorrhagic enteritis. All females had persistent corpora lutea. Cornification of the oesophageal glands observed in deficient fowls and rats was not found in pigs. Elongation of filiform papillae of the edge of the tongue was attributed to vitamin A deficiency by Schoop [*Tierärztl. Umsch.* **10,** 194 (1955)], but K regarded elongated papillae as normal in young pigs.

—R.M.

Guerrant, N. B. (1960). **Chlortetracycline and growth promoting effect of beta carotene and vitamin A in rats.**—Proc. Soc. exp. Biol., N. Y. **105,** 400-403. [Author's summary modified.] **1904**

Addition of chlortetracycline to a vitamin A-deficient diet stimulated additional growth in vitamin A-deficient rats that received restricted supplements of beta carotene or vitamin A. Extent of additional growth depended on amount of the antibiotic in the basal diet and amount of the supplementary vitamin fed. A diet that contained 1 g./kg. of chlortetracycline exerted the greatest growth-stimulating effect in rats that subsisted on a minimum maintenance intake of vitamin A or beta carotene. This increase in growth ranged from 200% in the low vitamin A-intake animals to no increase in growth rate of

animals that received the higher doses of the vitamin. Food requirement per unit of weight increase was lower in the rats that received chlortetracycline in their diet. Rats restricted to equal food intakes made greater gains in weight when the diet contained the antibiotic.

King, J. M. & Maplesden, D. C. (1960). **Nutritional muscular dystrophy in calves. III. Purkinje fiber degeneration in calves with experimentally produced nutritional muscular dystrophy.**—Canad. vet. J. **1,** 421-426. [Summary in French. Authors' summary modified.] **1905**

Calves fed a tocopherol deficient diet developed degeneration of the Purkinje fibres of the heart and Zenker's degeneration of the skeletal and tongue muscles.

Since blood serum magnesium and plasma tocopherol levels were low, the fact that the Purkinje degeneration may be produced by a synergic action between low magnesium and low tocopherol levels cannot be ruled out by the data presented.

Nishida, T., Tsuchiyama, H., Inoue, M. & Kummerow, F. A. (1960). **Effect of intravenous injection of oxidized methyl esters of unsaturated fatty acids on chick encephalomalacia.**—Proc. Soc. exp. Biol., N.Y. **105,** 308-312. [Authors' summary modified.] **1906**

Cerebellar disorders developed in chicks 1–5 hours after i/v injection of 10 mg. of the hydroperoxide of methyl linoleate or of linoleic acid emulsified in 1 ml. of serum. No cerebellar disorders were noted, after injection, in birds kept on an identical diet but supplemented with 8 mg % α-tocopherol. Injection of reduced hydroperoxide, methyl 12-oxo-*cis*-9-octadecenoate or fresh methyl linoleate caused no cerebellar disorders. The severity of cerebellar disorders induced by injection of lipohydroperoxide was greatly influenced by dietary pretreatment, the cerebellum of chicks which had been kept on high protein, high fat, vitamin E deficient diets was damaged more extensively than that of chicks on adequate diets. These data suggest that nutritional encephalomalacia may be initiated by accumulation of sufficient, though still immeasurable, levels of lipohydroperoxide in the body.

Rahman, M. M., Davies, R. E., Deyoe, C. W. & Couch, J. R. (1960). **Selenium and Torula yeast in production of exudative diathesis in chicks.** — Proc. Soc. exp. Biol., N.Y. **105,** 227-230. **1907**

Addition of vitamin E, dried brewer's yeast or 0·05 p.p.m. selenium as sodium selenate improved growth and prevented exudative diathesis in chicks fed a purified diet containing soya bean protein. But Torula yeast as 20% or 30% of the purified diet hastened and increased the incidence of the disease.—M.G.G.

Marvin, H. N., Dinning, J. S. & Day, P. L. (1960). **Erythrocyte survival in vitamin-E deficient monkeys.** — Proc. Soc. exp. Biol., N.Y. **105,** 473-475. [Authors' summary modified.] **1908**

Maximal survival of Cr^{51}-labelled r.b.c. in monkeys on a vitamin-E deficient diet for 349 or more days was 35, 45 or 49 days, as compared with about 100 days in controls on an adequate diet. This effect and the associated anaemia were corrected by administration of vitamin E. The phenomenon is discussed.

Skeggs, H. R., Hanus, E. J., McCauley, A. B. & Rizzo, V. J. (1960). **Hydroxocobalamin: physiological retention in the dog.** — Proc. Soc. exp. Biol., N.Y. **105,** 518-521. [Authors' summary modified.] **1909**

Hydroxocobalamin, injected i/m into dogs, produced a more prolonged increase of serum vitamin B_{12} than did equal quantities of cyanocobalamin. The possible physiological significance of this is discussed.

Bach, S. J. & Hibbitt, K. G. (1960). **Biochemistry of bovine ketosis: the therapeutic use of fumarate and cysteamine.** — Nature, Lond. **188,** 382-383. **1910**

The demonstration that the serum citrate level in cattle with ketosis is 20% of normal is suggestive of a reduced formation of citrate from oxalacetate and acetyl coenzyme A. This may be due to the competitive utilization of acetyl coenzyme A for fat synthesis. Acetyl coenzyme A is known to accumulate in the lactating mammary gland and to be deficient in the liver of ketotic ewes whilst the acetylating capacity of ketotic cows has been shown to be reduced.

Other evidence of a suboptimal reaction rate of the citric acid cycle is provided by the low level of succinate and high levels of pyruvate and oxoglutarate in the serum of ketotic cows.

This hypothesis has been tested by the

administration to ketotic cows of cysteamine believed to possess coenzyme A activity in certain circumstances. This treatment led to a fall in serum levels of pyruvate and oxoglutarate. Treatment with fumarate, on the other hand, led to a rise in the levels of these two serum constituents. This could be interpreted by suggesting that fumarate stimulated the citric acid cycle without providing coenzyme A necessary for oxidation of pyruvate and oxoglutarate. Stimulation of the citric acid cycle leads to increased formation of adenosine triphosphate which is necessary for glucose synthesis. Thus the serum glucose level rises after treatment and the degradation of the newly available glucose produces reduced pyridine nucleotides which are necessary for the reduction of aceto-acetyl coenzyme A and a decrease in ketone body levels.—E. J. H. Ford.

DISEASES, GENERAL

Gylstorff, I. (1960). Zur Pathologie des Alters und Alterns der landwirtschaftlichen Nutztiere mit besonderer Berücksichtigung der Präsenilität. **[Pathology of ageing in farm animals with special reference to presenility.]** — Zuchthyg. FortpflStörung. u. Besamung **4,** 186-196. [Summaries in English and Russian.] **1911**

Farm animals are usually slaughtered before they reach the limit of their natural lives. Presenility, which is mainly due to the ageing of endocrine glands and associated organs can, however, be seen in dogs. Cystic ovarian degeneration in cows is not part of the ageing process. When productivity is increased, it should be in physiological harmony with the whole organism, so that the length of productive life is as near as possible to the possible life span.—E.G.

Forenbacher, S. & Rode, B. (1961). **Investigations on the role played by the insular apparatus in the pathogenesis of paralytic myoglobinuria in the horse. I. Changes in the structure and function of the insular apparatus in the healthy horse under the effect of cobalt chloride, alloxan and glucose.**—Zbl. VetMed. **8,** 1-11. [In English. Summaries in French, German and Spanish. Authors' summary modified.] **1912**

Experiments were carried out on 14 healthy horses to study the pancreatic islets, particularly in pathogenesis of equine myohaemoglobinaemia. The islets were damaged by cobalt salts in 8 horses, with alloxan in 4 and with large amounts of glucose in 2.

Clinical, haematological and biochemical studies were made, with special reference to glycaemia, glycolysis in blood, glucose tolerance, and conversion of pyruvate and lactic acid. For histological study partial pancreatectomy was carried out. The results showed that the A-cells of the islets were not damaged by cobalt chloride. Alloxan seemed to produce stimulation of the B-cells and can produce sub-diabetic changes in this way, but it does not produce the same kind of damage to B-cells as occurs in alloxan diabetes in other species. Intensive administration of glucose also stimulates the B-cells. These observations show that the islets in the horse have considerable functional reserves.

Lanz, E. (1961). Die Behandlung der infektiösen Bronchopneumonie des Rindes mit hochaktiviertem Lebertran. **[Treatment of infectious bronchopneumonia in cattle with activated cod-liver oil.]** — Dtsch. tierärztl. Wschr. **68,** 129-131. [Summary in English.] **1913**

Activated cod-liver oil (medicinal cod-liver oil deacidified with lye and supplemented so that it has a minimum content of 2,000 i.u. vitamin A and 500 i.u. vitamin E per ml.) has been used successfully to treat infectious bronchopneumonia in cattle in Switzerland since 1935. One to three doses of 40–60 ml. are given s/c at intervals of 1–2 days. Spread of the disease is prevented by treating the healthy animals in affected herds. Serious cases are also given antibiotic treatment. High doses of vitamins A and D were less effective than the activated cod-liver oil.—M.G.G.

Seifert, H. (1960). Die Bekämpfung eines "Rindersterbens" in der Cordillere Nord-Perus. **[Control of cattle losses in the mountains of North Peru.]**—Zbl. VetMed. **7,** 991-1015. [Summaries in English, French and Spanish.] **1914**

Over a period of five years mortality among 8,500 cattle on a ranch 5–13,000 feet up in the mountains of North Peru, was reduced from 6% to 2·8%. Main causes of death were blackleg, piroplasmosis, anaplasmosis, "altitude disease", haemorrhagic septicaemia and poisoning with *Cestrum* species. A number of cattle died in accidental falls from cliffs. "Altitude disease" and

anaplasmosis were believed to be the same disease, at least in that particular region. The theory was advanced that anaplasma caused anaemia, which was responsible for oxygen deficiency and ultimately cardiac decompensation. Details were given of control of blackleg and pasteurellosis by locally manufactured vaccines, control of piroplasmosis by eradication of ticks and Acaprin, Berenil and Ganaseg therapy. Anaplasmosis responded best to combined tetracycline–methionine treatment. Attempts were made to eradicate *Cestrum* plants.—E.G.

Neal, F. C., Ramsey, F. K., Preston, K. S. & Creel, R. (1960). **Polioencephalomalacia in Iowa cattle.** — Iowa St. Univ. Vet. **23,** 15-16. **1915**

This disease of cattle and sheep, characterized by blindness in both eyes without visible eye lesions, and by other central nervous symptoms, has been recognized in various parts of the U.S.A. and Canada. This paper describes the symptoms and lesions in a heifer in Iowa. Blindness, ruminal stasis, depression, opisthotonus, and tonic and clonic muscular spasms were observed, and the animal was destroyed *in extremis* on the 8th day. Lesions were found only in the brain, where they were typical—yellowish discoloration associated with softening, and cavities in the cerebral cortex. [See also *V.B.* **27,** 907.] —M.G.G.

Rubarth, S. (1960). **Hepatic and subphrenic abscesses in cattle with rupture into vena cava caudalis.**—Acta vet. scand. **1,** 363-382. [In English. Summaries in German and Swedish.] **1916**

Between 1934–1959 liver abscesses which had burst and discharged their contents into the posterior vena cava, were seen in 56 of 1,279 P.M. examinations in cattle. Respiratory lesions included emphysema, haemorrhages and pulmonary oedema. There were endocardial and epicardial petechiae. Spleen and lymph nodes were hyperaemic. Abscesses were either within the parenchyma or between liver and diaphragm, rarely within the thorax or in the kidney region. *Corynebact. pyogenes* or *Fusiformis necrophorus,* alone or with streptococci, were isolated from abscesses. —E.G.

Hojovec, J. (1961). Rentgenová diagnostika rhinitis athrophicans suum (sípavka prasat). **[X-ray diagnosis of porcine atrophic rhinitis.]** — Veterinářstvi **11,** 48-51. [Summaries in English, German and Russian.] **1917**

Early diagnosis of atrophic rhinitis of the turbinate bones was possible by X-rays. It was suggested that among the documents of valuable breeding stock offered for sale, X-ray photographs of the head should be included. The need for clarification of the aetiology and of certain epidemiological factors was stressed. —E.G.

I. Solomkin, P. S. (1960). **[Porcine atrophic rhinitis and its control.]**—Veterinariya, Moscow No. 11 pp. 35-41. [In Russian.] **1918**

II. Lamikhov, K. F. (1960). **[Aetiology of porcine atrophic rhinitis.]**—Ibid. pp. 42-45. [In Russian.] **1919**

III. Kvasnikov, A. K. (1960). **[Aetiology of porcine atrophic rhinitis.]**—Ibid. pp. 45-46. [In Russian.] **1920**

IV. Leont'ev, I. M. (1960). **[Significance of trichomonads in porcine atrophic rhinitis.]**—Ibid. p. 47. [In Russian.] **1921**

I. S. reviewed Russian work on this disease and discussed problems yet to be solved.

II. Symptoms and P.M. lesions characteristic of atrophic rhinitis developed in pigs one week or 4 months of age given nasal exudate from affected pigs, but not when the exudate was treated with antibiotics before instillation. Five of 11 piglets given filtrates of nasal exudate developed sneezing, and 4 of these a rise in temp.; slaughter of all the animals at the age of 7–9 months revealed atrophy of the ventral turbinates and bending of the nasal septa, but no signs of inflammation. It was concluded that a filtrable virus may be the primary agent of the disease, but that various organisms play a part in its development.

III. Five piglets were infected intranasally with material from pigs with atrophic rhinitis, and 5 piglets with filtrate of such material. Sneezing developed in all animals, but later and in a milder form in the pigs given filtrates. Lesions of atrophic rhinitis were found in all 5 pigs of the first group that died or were killed, but not in the 5 of the second group that were killed on the 49th or 124th day after infection. *Pseudomonas pyocyanea, Pasteurella multocida* and cocci were isolated from pigs of the first group. Those of the second group yielded no pathogenic microflora.

IV. *Trichomonas* was found in 95 of 146 smears from the nasal cavities of pigs with atrophic rhinitis, and in smears from all of 20

pigs on farms free from the disease. It was concluded that *Trichomonas* plays neither a primary nor a secondary role in atrophic rhinitis.—M.G.G.

Kersten, W. & Beck, G. (1960). Zur Pathologie und Pathogenese der sogenannten Oedemkrankheit und des sogenannten plötzlichen Herztodes der Schweine. **[Pathology and pathogenesis of oedema disease and fatal syncope in pigs.]**—Mh. Tierheilk. **12,** 116-128. **1922**

Thirty-seven pigs that died of oedema disease and 20 that died of "Herztod" were examined pathologically and histologically. The authors found the two conditions to be very similar pathologically and attempted to explain both on the basis of the stress syndrome theory.—R.M.

Bömer, H. (1961). Bestimmungen des Calcium- und Magnesiumgehaltes der Herzmuskel von gesunden und an sog. Herztod erkrankten Schweinen. II. Mitteilung: Topochemische Bestimmungen. **[Calcium and magnesium content of the heart muscle of healthy pigs and pigs with fatal syncope. II.]** — Dtsch. tierärztl. Wschr. **68,** 81-82. [Summary in English.] **1923**

In normal pigs Ca was distributed evenly throughout the heart muscle, but in pigs stunned electrically and bled after developing signs of fatal syncope it was concentrated in and around the walls of the heart muscle cells. Considerable deposits were found beneath the epicardium and in the intima and media of the vessel walls, particularly the arteries. Attempts to demonstrate Mg with titan yellow were unsuccessful, but it was assumed that Mg behaved in a similar fashion. [See also *V.B.* **31,** 891.]—M.G.G.

Manevich, Z. A. & Veĭin'sh, É. I. (1961). **[Oedema disease of pigs and the therapeutic efficacy of calcium chloride.]**—Veterinariya, Moscow No. 1 pp. 39-40. [In Russian.] **1924**

Treatment consisted of intra-abdominal injection of 2–10 ml. of 5–10% calcium chloride soln. alone or mixed with [? an equal volume of] 40% soln. of urotropin (hexamine). Improvement was observed 2–4 hours after injection. The number of cases treated is not given.—R.M.

Jennings, M. A., Florey, H. W., Stehbens, W. E. & French, J. E. (1961). **Intimal changes in the arteries of a pig.**—J. Path. Bact. **81,** 49-61. [Authors' summary modified.] **1925**

A pig dying at over 7 years of age had localized intimal thickenings in the coronary arteries and in the aorta. The largest was between 4 and 5 cm. long and was just above the aortic bifurcation, and others were at the orifices of vessels.

Microscopically the plaques had a basis of collagen and contained much elastic tissue, with smooth-muscle fibres, fibroblast-like cells, fat-filled cells, and extracellular fat. The last was in considerable quantity in the larger lesions, where in one or two places the appearance suggested the beginning of atheromatous softening. Calcification was common, and in the coronary arteries calcified lesions distorted the lumen of the vessel. No capillaries or lymphocytes were seen in the lesions. Beneath the plaques the internal elastic lamina showed breaks, splitting or fragmentation.

Away from the plaques, the coronary arteries showed various degrees of generalized intimal thickening with proliferation of elastic tissue. Near their origins the thickened intima of these vessels contained many fat-filled cells and some free fat. The aortic intima was little thickened, but in the thoracic segment it contained fat-filled cells.

The cerebral arteries showed local thickenings, visible microscopically, at the bifurcations, similar to those described in man and other species. [Four plates of photomicrographs.]

Kowalczyk, T., Hoekstra, W. G., Puestow, K. L., Smith, I. D. & Grummer, R. H. (1960). **Stomach ulcers in swine.**—J. Amer. vet. med. Ass. **137,** 339-344. **1926**

A report on 8 cases in the field and 23 in experimental work on parakeratosis. The aetiology of the condition remained obscure although the histological picture resembled that described by Gitter & Austwick [*V.B.* **29,** 2055]. No differential staining with periodic acid-Schiff stain or cultural examination were mentioned although the authors refer to their failure to reproduce this condition in pigs by i/v injection of unspecified micro-organisms isolated from the ulcers.—M. Gitter.

Schiefer, B. (1960). Untersuchungen über das Problem der urämischen Pneumonie beim Hund. **[Lung lesions in uraemic dogs.]**—Berl. Münch. tierärztl. Wschr. **73,** 384-387. [Summary in English.] **1927**

In 16 dogs with uraemia caused by nephritis, the most frequent lung changes were

pulmonary oedema, catarrhal purulent bronchitis and interstitial thickening. In 2 cases fibrin network was observed, and in 2 others pseudohyaline membranes had formed in the alveoli. The pathogenesis of uraemic pneumonia was discussed.—M.G.G.

Almlöf, J. (1961). **On achondroplasia in the dog.**—Zbl. VetMed. **8,** 43-56. [In English. Summaries in French, German and Spanish. Author's summary modified.] **1928**

The author described clinical and pathological observations on a litter of Poodles. The histological picture was typical of achondroplasia. In addition, the inner annulus zone of the intervertebral disks was immature. This observation is in accordance with the appearance of the disks of new-born individuals belonging to the breeds especially predisposed towards disk degeneration—the so-called chondrodystrophic breeds.

Magrane, W. G. (1961). **Cataract extraction: an evaluation of 104 cases.**—J. Small Anim. Pract. **1,** 163-168. **1929**

Of 69 dogs between 9 months and 6 years of age at the time of operation (juvenile cataract), 38 were Cocker Spaniels, 11 Wire-haired Terriers, 7 Poodles; the remainder belonged to ten other breeds. Of 35 dogs with senile cataract (7–14 years of age) 12 were Cocker Spaniels, 4 Boston Terriers, 4 Wire-haired Terriers, 3 Poodles; the remainder belonged to seven other breeds.—R.M.

Silverstein, E., Sokoloff, L., Mickelsen, O. & Jay, G. E., Jr. (1961). **Primary polydipsia and hydronephrosis in an inbred strain of mice.**—Amer. J. Path. **38,** 143-159. [Part of authors' summary.] **1930**

A genetic abnormality manifested by an extreme polydipsia and polyuria that seemed to serve no physiological purpose appeared in the STR/N line of mice. In males polyuria led to hydronephrosis apparently because a plug in the urethra impeded the passage of the large volumes of urine. These plugs were present also in males of other strains where they produced no disturbance since urine volumes were normal. STR/N females had polyuria but, in the absence of the plugs, did not develop hydronephrosis.

Löliger, H-C. (1960). Die interstitielle Pneumonie des Huhnes. **[Interstitial pneumonia in fowls.]**—Dtsch. tierärztl. Wschr. **67,** 636-639. [Summary in English.] **1931**

L. differentiated two main forms of interstitial pneumonia in fowls. One form, associated with salmonellosis, pasteurellosis, TB. and *E. coli* infection, is characterized by granulomatous inter- and intra-lobular pneumonia and by specific lesions caused by the individual bacteria involved. The other form, due to virus infections, is characterized by lympho-histiocytic peribronchial pneumonia, but without virus-specific characteristics.

—E.G.

Rogers, S., Gordon, J. & McClaren, J. (1960). **LD-50 and mitotic rate of animals at time of exposure to X-radiation.** — Proc. Soc. exp. Biol., N.Y. **105,** 240-241. [Authors' summary.] **1932**

A correlation is demonstrated between mitotic rate of individual mice at time of exposure and lethal effect of X-irradiation. The significance of this finding is discussed.

Mizuno, N. S., Perman, V., Joel, D. D., Bates, F. W., Sautter, J. H. & Schultze, M. O. (1960). **Survival of calves treated with autologous bone marrow after exposure to lethal dose of whole-body irradiation.**—Proc. Soc. exp. Biol., N.Y. **105,** 317-320. [Authors' summary modified.] **1933**

Intravenous injection of homologous bone marrow or of a mixture of foetal liver, spleen and thymus failed to protect calves against death from bone marrow damage after exposure to a lethal dose of whole-body gamma-radiation. Nine of 15 calves treated with autologous bone marrow recovered after a severe haematological crisis; 8 of these developed normally, showed no apparent signs of late radiation damage, had regular oestrous cycles and 7 were pregnant at the time of writing.

Buldakov, L. A. & Moskalev, Y. I. (1960). **[Migration of strontium-90 from plant to sheep to foetus.]** — Bull. Biol. Med. exp. URSS No. 10 pp. 111-113. [In Russian. Summary in English.] **1934**

In sheep fed for 6 months on contaminated hay having a specific activity of 0·05 μc/kg., the concentration of Sr^{90} in the skeleton reached 0·263 μc/kg. of fresh bone. The skeletal concentration was 14·6 times greater in the ewe than in foetuses weighing 200–300 g. But the conc. of Sr^{90} expressed as microcuries per gramme of calcium in the bones of ewes was only 2·3 times that of the foetus. The conc. of Sr^{90} (in microcuries per gramme of calcium) in hay was 4·73 times higher than in the bones of ewes and 10·9 times higher than in the foetal bones; the conc.

of Sr^{90} diminished during passage from hay to foetus.—R.M.

Garner, R. J. & Jones, H. G. (1960). **Fission products and the dairy cow. IV. The metabolism of ^{131}I following single and multiple doses.**—J. agric. Sci **55**, 387-390. **1935**

Four cows were given by mouth 1 mc. of I^{131}, in one trial as a single dose, and in another trial as a multiple dose every 6 hours for 14 days. In the 14 days after the single dose 48·8% was excreted in the urine, 20·7% in the faeces, and 8·3% in the milk. The curves of activity in urine, milk and thyroid gland after administration of the multiple dose differed slightly from those predicted, but the differences were not considered significant.
—M.G.G.

Thompson, R. H. S. (1961). **Symposium on disseminated sclerosis. Myelinolytic mechanisms.**—Proc. R. Soc. Med. **54**, 30-33. **1936**

The biochemistry of localized demyelination in the central nervous system, and the search for a substance which may initiate the demyelination process, were discussed. Numerous attempts to demonstrate such a locally acting myelinolytic substance in body fluids of patients with disseminated sclerosis have proved inconclusive, although it has been claimed repeatedly that cerebrospinal fluid and serum from multiple sclerosis patients produced demyelination of nervous tissue *in vitro*, whereas normal fluids had very little or no such effect.

There was evidence of the presence in the c.n.s. of lysolecithin, a potentially myelinolytic, solubilizing substance, stated to be either a breakdown product of lecithin due to the activity of phospholipase A, or produced by direct biosynthesis, possibly as a precursor of lecithin. It is as yet unknown to what extent release of lysolecithin, or failure of the enzyme systems concerned with its formation or removal, is associated with the demyelination process. Further work is contemplated with normal brain material and material from patients with allergic encephalomyelitis and multiple sclerosis.—E.G.

POISONS AND POISONING

Hammond, P. B. & Aronson, A. L. (1960). **The mobilization and excretion of lead in cattle: a comparative study of various chelating agents.** — Ann. N.Y. Acad. Sci. **88**, 498-511. **1937**

This paper is part of the proceedings of a conference on chelation phenomena (Article 2 of vol. 88 of the *Annals*). A number of compounds were investigated for their effect on calves experimentally poisoned with lead nitrate. The authors recommended further investigation of dithiol and aminothiol chelating agents. Calcium edetate gave the best results.—R.M.

Garner, R. J., Sansom, B. F., Jones, H. G. & West, L. C. (1961). **Fission products and the dairy cow. V. The radiotoxicity of iodine-131.** — J. comp. Path. **71**, 71-84. [Authors' conclusions.] **1938**

Results are given of experiments in which ^{131}I was administered to adult, non-pregnant, lactating cows in doses of 1·4 to 140 mc. over a 14 day period. These amounts are estimated to have delivered radiation doses to the thyroid gland of 1,500 to 290,000 rad.

The clinical effects of ablation of the thyroid gland by means of radiation (radiothyroid-ecrexis) were similar to those described after surgical removal of the gland. The minimum radiation dose needed to have a deleterious effect on the animal is estimated to be of the order of 100,000 rad.

Tustin, R. C., Minne, J. A. & Adelaar, T. F. (1960). **Acute mercury poisoning in a dog.** — J. S. Afr. vet. med. Ass. **31**, 297-299. [Authors' summary modified.] **1939**

In a case of mercury poisoning by the inhalation of metallic mercury vapour the most apparent lesions were congestion of the meningeal vessels and liver, a greyish discoloration of the brain, nephrosis, and hyperaemia and oedema of the lungs.

Harrison, D. L. & Manktelow, B. W. (1960). **Dieldrin poisoning of dogs. I. Field cases.**—N. Z. vet. J. **8**, 113-116. [Authors' summary modified.] **1940**

Clinical and analytical data from 40 cases of suspected dieldrin poisoning in sheepdogs are given. The syndrome is characterized by anorexia, emaciation, and nervous symptoms. Except in 4 cases where concentrated dieldrin formulations were misused, the actual method of exposure to the insecticide was unknown. Since most cases occurred at times when sheep are dipped, it is considered that sheep dips, sprays, or dusts could have been the major source of dieldrin.

Hosein, E. A. & Proulx, P. (1960). **Chemical and biochemical analyses on brain tissue preparations during the epileptiform-like activity of dieldrin and other cerebral convulsants.** — J. agric. Food Chem. **8,** 428-431. [Authors' summary modified.] **1941**

A mixture of betaine coenzyme A esters was released in the brain of convulsing rats poisoned with dieldrin, through damage of the brain mitochondria. As the properties of these esters are like those of acetylcholine, their release from brain mitochondria may be an important step in elucidating the aetiology of epileptiform-like convulsions.

Huddleston, E. W., Gyrisco, G. G. & Lisk, D. J. (1960). **DDT residues on New York dairy farms following the gypsy moth eradication program.** — J. econ. Ent. **53,** 1019-1021. [Authors' abst. modified.] **1942**

Aerial-applied DDT-oil solutions for eradication of the gypsy moth, *Porthetria dispar* in 1957 were highly persistent on forage and little affected by weathering. However, the growth of new grass with its great increase in mass and volume was a very important factor in residue "loss".

The use of DDT as an eradicant spray resulted in widespread contamination of milk which persisted for at least a year. At one poultry farm checked, eggs were contaminated for one month.

Carpenter, C. P., Weil, C. S., Palm, P. E., Woodside, M. W., Nair, J. H. & Smyth, H. F., Jr. (1961). **Mammalian toxicity of 1-naphthyl-*N*-methylcarbamate (Sevin insecticide).** — J. agric. Food Chem. **9,** 30-39. [Authors' summary modified.] **1943**

Information is presented on metabolism, cholinesterase inhibition, alleviation of toxic symptoms with atropine sulphate and their aggravation by pyridine-2-aldoxime methiodide in lab. animals, and the absence of neuromuscular degeneration, carcinogenicity, and sensitizing ability. The responses to single doses by the oral, parenteral, cutaneous and respiratory routes are described. Rats tolerated 200 p.p.m. in the diet for 2 years, and dogs 400 p.p.m. for one year.

Prodanov, P. & Konstantinov, A. (1960). **[Toxicity of parathion for fowls.]**—Izv. Inst. Pat. Zhivotni, Sofia **8,** 301-304. [In Bulgarian. Summaries in French and Russian.] **1944**

Oral administration of single, varying doses of 0·5% aqueous emulsion to 43 fowls revealed that the maximum tolerated dose of parathion was less than 4 mg./kg. body wt., the LD_{50} was 7·5–8 mg./kg., and the LD_{100} was 10–15 mg./kg. The main signs of acute poisoning were profuse salivation and lacrimation and muscle spasms.—R.M.

Rees, K. R., Sinha, K. P. & Spector, W. G. (1961). **The pathogenesis of liver injury in carbon tetrachloride and thioacetamide poisoning.**—J. Path. Bact. **81,** 107-118. [Part of authors' introduction.] **1945**

There is considerable doubt about the interrelations of fatty degeneration, mitochondrial damage and hepatic necrosis in toxic liver injury.

It was the purpose of the present investigation to elucidate these interrelations by studying the time relations of the various phenomena and by dissociating them with the aid of suitable chemical compounds.

Augustinsson, K.-B., Grant, C. A., Olsson, B. & Thafvelin, B. (1960). **Blood plasma esterases in pigs with induced dietetic and toxic hepatic lesions.**—Zbl. VetMed. **7,** 729-744. [In English. Summaries in French, German and Spanish.] **1946**

These Swedish workers set up dietetic liver necrosis in some pigs and administered hepatotoxic doses of carbon tetrachloride to others. The arylesterase activity of the serum of these pigs was not greatly influenced by the presence of liver lesions, but it was depressed by prolonged administration of CCl_4 or by the feeding of potentially hepatonecrogenic diets. Changes in transaminases and cholinesterase were also studied.—R.M.

Fritzsch, W. (1960). Verdorbene Rübenblattsilage—Ursache einer akuten Erkrankung in einem Rinderbestand. **[Poisoning of cattle with beet-top silage.]** — Mh. VetMed. **15,** 802-804. **1947**

Eleven cattle fed decomposed beet-top silage developed severe diarrhoea, fever, and unsteadiness. Three that collapsed with dyspnoea had to be slaughtered. It was suggested that the beet-tops had been dressed with an excessive amount of kofa salt (a mixture of calcium formate and sodium nitrite).—M.G.G.

Denz, F. A. & Hanger, W. G. (1961). **The liver toxin in Myoporum laetum.**—J. Path. Bact. **81,** 91-99. [Authors' introduction modified.] **1948**

The leaves of the Ngaio tree *(Myoporum laetum)* are known to contain a liver toxin.

The tree grows to 20–30 feet and its leaves are usually out of reach of stock. When branches are blown down, cattle, sheep, horses and pigs all readily eat the leaves, with fatal results. Ngaio poisoning leads to liver damage, icterus and photosensitivity. A number of workers have studied the chemistry of the essential oil obtained from the leaves, but the identity of the toxin has not been established.

This paper describes the development of an assay for the toxin in Ngaio leaves and its use to determine the chemical identity of the toxin.

Worker, N. A. & Dodd, D. C. (1960). **Photosensitivity diseases in New Zealand. XXII. Studies in the effect on the rabbit of injection of extracts containing facial eczema toxin.**—N.Z. agric. Res. **3**, 712-724. [Authors' summary modified.] **1949**

The authors investigated the effects of toxic extracts of *Pithomyces chartarum* (*Sporidesmium bakeri*) administered parenterally to rabbits.

Lesions characteristic of facial eczema liver damage were found after injection of toxic extracts into the portal system. Macroscopic damage was first observed 48–96 hours after injection. The earliest evidence of histological change was noted 3–6 hours after injection.

Liver damage was consistently noted after injection of extracts into the duodenum and gall-bladder, rarely after injection into the systemic circulation by the jugular or ear vein, but never after injection into the caecum.

It is concluded that the toxin is absorbed through the wall of the intestine and transported by way of the portal circulation to the liver where it is removed instantaneously by the liver cells. The possible involvement of the gall-bladder in the pathogenesis of liver damage is discussed.

Brook, P. J. & Matthews, R. E. F. (1960). **The production of ^{35}S labelled sporidesmin.** —N.Z. J. Sci. **3**, 591-599. [Authors' summary.] **1950**

The isolation of ^{35}S-labelled sporidesmin from *Pithomyces chartarum* grown on a defined medium containing inorganic sulphate is described. Toxin production by three strains of the fungus is estimated by the use of labelled material. In mature cultures sporidesmin is not confined to the spores but it is not established whether toxin is actually produced in other parts of the fungus. Growth and conidia formation are less sensitive to sulphur deficiency than is sporidesmin production. Sporidesmin is unstable in aqueous media in strong light, being converted to a mixture of at least two substances with solubilities differing from sporidesmin.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

van Oss, C. J., Friedmann, J. C. & Fontaine, M (1961). **Anticomplementary action of aspirin.**—Nature, Lond. **189**, 147. **1951**

The anticomplementary action of aspirin, salicylic acid, quinine and cortisone was studied by their effect on the haemolysis provoked by the action of g.pig serum on sheep erythrocytes sensitized with rabbit anti-sheep erythrocytes serum: aspirin was the only one with a strong anticomplementary action within normal therapeutic doses. Work on the action of aspirin on human complement *in vitro* and *in vivo* is in progress, but it is suggested that the anticomplementary action of aspirin may explain its multiple benefits in pathological states such as allergy, rheumatism and fever.—E.V.L.

D'Arcy, P. F. & Howard, E. M. (1960). **Safety of iron preparations.** — Lancet, December 10th 1304-1305. **1952**

The maximum safe oral doses of different iron salts, determined by experiments in dogs, were: ferrous carbonate 1·5 g. ferrous iron per kg., ferrous sulphate less than 0·012, ferrous gluconate 0·047, and ferrous succinate 0·094. The use of ferrous carbonate would reduce the symptoms of intolerance to iron in patients and the danger of accidental poisoning in children.—M.G.G.

Garrod, L. P. (1960). **The relative antibacterial activity of four penicillins.**—Brit. med. J. December 10th, 1695-1696. **1953**

This is an extension of previous work on antibacterial activity of penicillins [see *V.B.* **30**, 2139]. Another penicillin—6-(2, 6-dimethoxybenzamido) penicillinate monohydrate (BRL 1241; "celbenin")—and more

bacterial species are included. Results, presented in tabular form, are discussed.
—T.E.G.R.

Ormiston, E. E., Albright, J. L., Witter, L. D. & Brodie, B. O. (1960). **Observations on the infusion of penicillin in the mammary gland of the bovine.**—J. Dairy Sci. **43,** 1506-1508. **1954**

Ten cows in various stages of lactation and production, three of which were infected with mastitis, were injected with 100,000 units procaine penicillin G in oil suspension and 2 weeks later with a similar dose in aqueous solution, into the right rear quarter of the udder. All cows were milked with an individual quarter milker for 96 hours after infusion. Penicillinase disks were used to confirm the presence of penicillin in the samples. All samples of milk from cows treated with the aqueous preparation were free from penicillin in 72 hours while only 50% of those treated with the oily preparation were free in 96 hours. There was greater migration of penicillin from the infused to the untreated quarters when water was the carrier. Two of the three infected animals showed no transfer of penicillin at all.—Joyce E. Hammant.

Blobel, H. & Burch, C. W. (1960). **Diffusion of dihydrostreptomycin and chlortetracycline into milk of cows following parenteral administration.** — J. Amer. vet. med. Ass. **137,** 698-700. [Authors' summary modified.] **1955**

Measurable concentrations of dihydrostreptomycin were detected in the milk secretions of 11 of 26 cows given 0·5 g. of dihydrostreptomycin sulphate crystalline per 100 lb. body wt. intramuscularly. When 1 g. of dihydrostreptomycin per 100 or 50 lb. body wt. was given i/m to 12 cows, the drug was demonstrable in the milk of all 24 cows. At any of the 3 dose levels, the drug was eliminated from the udder within 48 hours.

The intravenous administration of 2 mg. chlortetracycline crystalline per lb. body wt. to 24 cows and 4 mg. of chlortetracycline per lb. to 12 cows resulted in the excretion of detectable amounts of chlortetracycline in the milk of all. The chlortetracycline levels persisted up to 48 hours after i/v administration.

English, P. B. (1960). **Serum penicillin concentrations in sheep after treatment with potassium, procaine and fortified benzathine benzylpenicillins.** — Aust. vet. J. **36,** 253-260. **1956**

The sheep were each given, s/c, the three penicillins at three dosage levels.

After potassium benzylpenicillin, at 6,000, 12,000 and 24,000 units/kg. body wt., mean serum concentrations at 30 min. were 8·46, 15·4 and 10·95 μg./ml. respectively, and penicillin could be detected from 8, 12 and 12 hours respectively after administration. After procaine benzylpenicillin at the same dosages, mean serum concentrations at 30 min. were 1·85, 1·10 and 1·26 μg./ml. and penicillin was detected for 30, 48 and 72 hours, respectively. After fortified benzathine penicillin, at 12,500, 25,000 and 50,000 units/kg., mean serum concentrations at 30 min. were 3·4, 14·4 and 15·2, and those at 120 hours were 0·016, 0·044 and 0·072 μg./ml., respectively.

The initial serum penicillin concentration in sheep was not elevated appreciably by increasing dose rates of potassium or procaine benzylpenicillin beyond 6,000 units/kg. body wt., and the dose rate of fortified benzathine benzylpenicillin beyond 25,000 units/kg. body wt. An increase in dosage with all three penicillins beyond these rates, increased the time for which serum levels could be detected after a single treatment.—G. A. Stewart.

Schlaak, W. (1961). Vitamin E bei drohendem Abort des Rindes. [**Vitamin E in the prevention of threatened abortion in cows.**]—Tierärztl. Umsch. **16,** 46-48. **1957**

Impending abortion was prevented in 17 of 20 cows, 4–8 months pregnant, by s/c injection of 100 ml. of a vitamin E preparation containing 30 mg. of tocopherol per ml.
—E.G.

Dolowy, W. C. & Hesse, A. L. (1960). **Chlopromazine premedication with pentobarbital anesthesia in the guinea pig.**—Illinois Vet. **3,** 112-115. **1958**

Satisfactory surgical anaesthesia lasting about 20 min. was obtained by i/p inj. of pentobarbitone sodium by itself at 37·5 mg./kg. body wt. Longer surgical anaesthesia (40–60 min.) was obtained by i/m inj. of chlorpromazine at 25 mg./kg. followed half an hour later by 30 mg./kg. pentobarbitone, at the risk of an occasional death (1 in 10).
—R.M.

See also absts. **1742** (haemosporidin in leptospirosis); **1746** (Borrelia anserina infection); **1760** (antibiotics in pulmonary and intestinal mycosis); **1764** (griseofulvin and amphotericin B in sporotrichosis); **1776** (zoalene in coccidiosis); **1840-1841 & 1940-1945** (insecticides); **1853-1857, 1859, 1866-1867, 1869, 1872-1874** (anthelmintics); **1913** (cod-liver oil in bovine bronchopneumonia).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Kibler, H. H. (1960). **Environmental physiology and shelter engineering. With special reference to domestic animals. LV. Energy metabolism and related thermoregulatory reactions in Brown Swiss, Holstein, and Jersey calves during growth at 50° and 80°F temperatures.**—Res. Bull. Coll. Agric. Univ. Mo. No. 743 pp. 38. [Author's summary modified.] **1959**

Respiratory activities in all three breeds were higher and varied more among individual calves in the 80°F. groups than in the 50°F. groups, but only the Holstein calves had appreciably higher rectal temperatures (1°F.). The importance of intrabreed selection for heat tolerance is suggested by the differences in rectal temperatures between individuals. One Holstein calf had as low rectal temperature as any Jersey or Brown Swiss calf. Pulse rates decreased with age and were slightly lower in the Holsteins at both 50° and 80° temperatures.

The Jerseys had higher rates of energy metabolism relative to their body weights. This disadvantage at 80°F. was balanced by their greater outer area of heat dissipating surface relative to body weight. Forty-hour fasts at 65°F. temperature lowered energy metabolism by almost 38% in all breeds.

The relation between energy metabolism and body weights was expressed by an equation.

Romijn, C. & Lokhorst, W. (1961). **Climate and poultry. Heat regulation in the fowl.**—Tijdschr. Diergeneesk. **86,** 153-172. [In English. Summaries in French, German and Dutch. Authors' summary modified.] **1960**

In the Blue North Holland fowl, the respiratory metabolism was minimal at environmental temperatures between 28° and 32°C. Below 32° relative humidity had no influence on the heat production. Cooling resulted in an increase of heat production; at 5°C. it increased by 50% provided the feathering was normal. In poorly feathered adult animals and in baby chicks an increase of 150% was observed.

At temperatures above 32° hyperthermia easily developed, in hens more readily than in cocks and the more quickly the higher the r.h. of the surrounding air. Ventilation should be adjusted to keep the humidity low, preferably with a temperature not higher than 32°C. The great importance of sufficient water supply was stressed.

Myczkowski, K. (1960). Rozwój i morfologia wisiorków skórnych szyi (appendices colli) u zwierząt domowych. [**Development and morphology of neck skin appendages in domestic animals, including pig, goat and sheep.**]—Weterynaria, Wroclaw No. 7 pp. 77-98. [In Polish. Summaries in English and Russian.] **1961**

The neck appendages were found in 30% of domestic grey goats and in 60–65% of hybrids. The origin of these skin appendages is in the ectoderm and mesenchyme, and in foetuses the chondroblast appears in the centre. In the adult they consist of skin, subcutaneous tissue, blood vessels, nerves and cartilage or compact connective tissue or muscles in the centre. In goats and pigs the appendage is joined by a branch of the sinus nerve and the 2nd and 3rd cervical nerves. Nerve supply to the right appendage is often different from that to the left one. The blood is supplied by the cranial or caudal appendage artery or both.—M. Gitter.

Dawes, G. S. (1960). **Discussion on the physiology of the new-born mammal. Anoxia and survival after birth.**—Proc. R. Soc. Med. **53,** 1039-1041. **1962**

The object of the study was to discover what factors limit survival and whether such factors can be so modified that survival may follow a period of anoxia which would otherwise either be fatal or cause permanent cerebral damage. It is considered that the ability of the very young animal to survive prolonged asphyxia depends on: a "tissue factor"—there is no evidence of the critical biochemical difference between young and adult tissues; a "circulatory factor", which would appear to depend on the greater glycogen reserves of the heart in immature animals and perhaps also on the effect of the "tissue factor" in the heart itself. It is not known how glycogen reserves are accumulated.
—T.E.G.R.

Raggi, F., Kronfeld, D. S. & Kleiber, M. (1960). **Glucose-6-phosphatase activity in various sheep tissues.**—Proc. Soc. exp. Biol., N.Y. **105,** 485-486. [Authors' summary modified.] **1963**

Glucose-6-phosphatase activity in sheep was appreciable in liver and kidney, detectable in intestine and salivary gland, but negligible in brain, muscle, stomach, rumen epithelium and mammary gland. Results suggest the

relative importance of these tissues as sources of blood glucose in sheep.

Halliday, R. & Mihailović, R. (1961). **I. Variations in the serum cholinesterase activity in normal rats. II. Cholinesterase levels in hand-reared and suckling rats.**—Proc. roy. Soc. Ser. B. **153**, 535-540 & 541-547. **1964**

Rats resemble dogs in that transfer of antibodies from mother to young occurs both before birth and for a large part of lactation. In both species the serum cholinesterase activity increases during the first few days of life. This increase did not occur in hand-reared puppies, but it did occur in rats hand-reared during the first two days of life. Enzyme absorption was compared with antibody absorption, and it was concluded that absorption of protein is correlated with its electrophoretic mobility.—R.M.

Van Duyne, C. M., Parker, H. R., Havel, R. J. & Holm, L. W. (1960). **Free fatty acid metabolism in fetal and newborn sheep.** — Amer. J. Physiol. **199**, 987-990. **1965**

In the normal new-born lamb there was a fivefold increase in plasma conc. of free fatty acids, without significant change in glucose or fructose, during the first 30 min. after birth. In lambs that failed to survive there was no increase in free fatty acids in plasma, while glucose concentration was the same as in surviving lambs.—R.M.

Hardwick, D. C. & Linzell, J. L. (1960). **Some factors affecting milk secretion by the isolated perfused mammary gland.**—J. Physiol. **154**, 547-571. [Part of authors' summary.] **1966**

It was concluded that the glands when removed have a large store of substrates and possibly hormones and that only the milk produced after 2 hours is formed from added precursors. The uptake of ^{32}P confirms that milk obtained later is so formed. Mean blood flow and the quantity of substrates needed and given must be allowed for in assessing milk yield during perfusion.

Talwalker, P. K., Meites, J., Nicoll, C. S. & Hopkins, T. F. (1960). **Effects of chlorpromazine on mammary glands of rats.** — Amer. J. Physiol. **199**, 1073-1076. **1967**

The drug induced lobular and alveolar growth and initiated lactation in rats already primed with 10 μg. oestradiol daily for ten days, when it was given in doses of 15 mg./kg. body wt. daily for 5 days. Its action was mediated through the anterior pituitary and not directly on the mammary gland.—R.M.

Linzell, J. L. (1960). **I. Valvular incompetence in the venous drainage of the udder. II. Mammary-gland blood flow and oxygen, glucose and volatile fatty acid uptake in the conscious goat. III. The flow and composition of mammary gland lymph.**—J. Physiol. **153**, 481-491; 492-509 & 510-521. **1968**

L. studied the distribution of valves and direction of blood flow in goats of various ages, conscious and anaesthetized. The external pudic and superficial epigastric veins of breeding females were varicose (enlargement, hypertrophy of muscular coats) and valvular incompetence resulted in the blood flowing in the opposite direction to the flow in male and virgin female goats, when the animal was standing.

Blood flow through the mammary gland was related to its weight and to milk yield at all stages of the reproductive cycle in goats trained to stand in the laboratory. Arterio-venous differences in oxygen, calcium, glucose and volatile fatty acids were also measured. Holding goats on their sides significantly reduced mammary blood flow.

A method was developed for continuous collection of mammary gland lymph from unrestrained, conscious goats. The rate of flow and composition of lymph was related to milk secretion and blood flow through the udder. General anaesthesia reduced lymph flow and changed its composition.—R.M.

Steel, J. D. & Whitlock, L. E. (1960). **Observations on the haematology of Thoroughbred and Standardbred horses in training and racing.**—Aust. vet. J. **36**, 136-142. Discussion: pp. 300-302. **1969**

Blood was collected from 100 Thoroughbred and 174 Standardbred horses in Sydney. The technique of collection and examination of the blood is summarized.

The red cell count, packed cell volume, and haemoglobin level in the Thoroughbred were significantly higher than in the Standardbred, and the mean corpuscular volume of the Standardbred was significantly higher than that of the Thoroughbred. After allowances were made for differences in technique the results obtained were in general agreement with those of other workers.

The authors have suggested criteria for the interpretation of blood counts, particularly with regard to anaemia, polycythaemia, and leucocytosis, and have suggested possible indices of fitness and potential from haematological examinations.—G. A. Stewart.

Kraft, H. (1960). Untersuchungen am Ruhekern von Leukozyten der Säugetiere mit besonderer Berücksichtigung geschlechtsspezifischer Merkmale. **[Research on the nucleus of leucocytes in mammals with reference to sex-specific characteristics.]** — Tierärztl. Umsch. **15,** 323-328 & 357-361. **1970**

"Drumstick" appendages to the nucleus of unsegmented and segmented neutrophiles were studied in blood smears from 30 horses, 38 cattle, 10 sheep, 23 pigs, 300 dogs, 20 cats, three elephants, two lion cubs, a puma, a bear, a fox, 33 llamas and two chinchillas, of various ages. Of these animals 168 were males, 266 females and 31 castrates. The presence of such specific appendages in more than 3% of nuclei was regarded as a fairly reliable proof of the female sex. The theory that "drumstick" appendages are in fact chromosomes could neither be confirmed nor disputed. [See also *V.B.* **30,** 2711 & 2712.] —E.G.

Condy, J. B. & Carr, W. R. (1961). **Observations on the serum proteins of Afrikander, Mashona and Ngami cattle.**—Vet. Rec. **73,** 91-93 & 100. [Authors' summary modified.] **1971**

There was a highly significant difference between the two breeds in both relative and absolute value of gamma globulin and also in the serum glutamic-pyruvic transaminase.

The serum proteins of 4 Ngami cattle are also reported: they had a very high gamma globulin and low albumin value.

Charton, A., Faye, P., Hervy, A., Lefrançois, C. & Gueslin, M. (1960). Etude des taux de quelques constituants minéraux et azotés dans le sérum des agneaux, de la naissance à l'âge de six mois. **[Fluctuations in mineral and nitrogenous constituents of the serum of lambs from birth to the age of six months.]** —Rec. Méd. vét. **136,** 1143-1156. [Summaries in English and Spanish.] **1972**

In about 20 lambs, the inorganic P content of the blood serum was almost double that in the dams during the second fortnight of life, thereafter it fell to equal that of the dams by the 6th month. As the Ca content hardly varied, the Ca : P ratio rose during the period from 1 to 1·8. The content of Mg, Na and K remained constant, the urea content was lower before weaning than after, the content of ammonia and total non-protein nitrogen increased with age, and that of residual nitrogen remained constant.—M.G.G.

Arnall, L. (1961). **Some aspects of dental development in the dog. I. Calcification of crown and root of the deciduous dentitions.** — J. Small Anim. Pract. **1,** 169-173. [Author's abst. modified.] **1973**

Six Bull Terrier litter-mate puppies were studied from birth to 7 months. Data from other breeds supported and extended the findings, and the periods of development for each tooth are compared in a composite histogram. Eight radiographic plates illustrate the salient features.

Rusev, V. (1960). **[Effect of propionic acid on the secretion of the abomasum in sheep. I.]**—Izv. Inst. Pat. Zhivotni, Sofia **8,** 131-147. [In Bulgarian. Summaries in English and Russian.] **1974**

Propionic acid (1·5 to 2% aqueous solution) administered into abomasum or rumen, or subcutaneously and intravenously, intensified the secretion of the abomasum by 10 to 60% above the initial level, causing a marked increase in the content of hydrochloric acid in the juice.

Tests in which propionic acid was applied after anaesthetizing the mucous membrane of the abomasum and following atropine administration indicate that the propionic acid or the products of its metabolism affect the secretion of the abomasum, particularly the secretion of hydrochloric acid, by means of the nervous system. A direct effect was also possible.—R.M.

Fell, B. F. (1961). **Cell shedding in the epithelium of the intestinal mucosa: fact and artefact.** — J. Path. Bact. **81,** 251-254. [Author's summary.] **1975**

Epithelial cells become detached from the mucous membrane of the intestine soon after death. In sheep good histological preparations can be obtained by rapid immersion fixation of short lengths of intestine. In rats an accurate histological picture is not obtained by immersion fixation of intestinal segments, but does follow perfusion-fixation. Intestinal perfusion-fixation may be performed either under anaesthesia or immediately after death. [Five photomicrographs.]

Booth, N. H., Bredeck, H. E. & Herin, R. A. (1960). **Baroceptor reflex mechanisms in swine.** — Amer. J. Physiol. **199,** 1189-1191. **1976**

Experimental occlusion of the carotid arteries revealed the presence of a carotid

pressure-sensitive mechanism in pigs, but its sensitivity was lower than that of the dog.
—R.M.

Pratt, C. W. M. (1961). **The effect of age on the arrangement of fibres in the bone matrix of the femur of the domestic fowl.**—J. Anat., Lond. **95,** 110-122. **1977**

Bones from embryos aged between 9 and 17 days and from birds aged between 1 day and 1 year were examined histologically.
—R.M.

Ts'ai Fan Yü, Berger, L., Kupfer, S. & Gutman, A. B. (1960). **Tubular secretion of urate in the dog.** — Amer. J. Physiol. **199,** 1199-1204. **1978**

The authors suggested that renal regulation of urate excretion involved glomerular filtration, tubular re-absorption (deficient but still demonstrable in the Dalmatian), and tubular secretion (ordinarily masked by preponderent re-absorption in non-Dalmatian dogs).—R.M.

Kramer, M. F. (1960). Spermatogenesis bij de stier. **[Spermatogenesis in the bull.]**—Thesis, Utrecht pp. 183. [In Dutch. Summary in English.] **1979**

The testicles of 6 healthy bulls aged 1–7 years were used : 6 μ sections were stained by the Feulgen/periodic acid-Schiff method of van Duyn. Of 8,701 tubular cross-sections studied counts were made of A-spermatogonia in 4,000, B-spermatogonia in 1,500, primary spermatocytes in 450 and of degenerating cells in 2,000. Some tubules were "reconstructed" from serial sections. The morphology of the different types of cell is described and their numbers tabulated. A spermatogenic cycle divided into 10 stages according to acrosome development is recognized. The cell-division pattern varies much in different parts of the same organ, far more than has been recorded for other species and by Ortavant (1955) for the bull. A ratio of 3·72 : 1 was established by counts, for the numbers of spermatids relative to primary spermatocytes, suggesting that only two meioses take place (theoretical ratio 4 : 1). Secondary spermatocytes divide very soon after their formation. The maximal vacuolation in the Sertoli cells was observed to coincide with the release of spermatozoa from the germinal epithelium. The cycle occurs along the length of a tubule with an irregular wave-type of periodicity.—F. L. M. Dawson.

Schulz, L.-C. (1960). Elektronenmikroskopische Untersuchungen zur endometrialen zytoplastischen Potenz beim Rind. **[Study by electron microscopy of cell structures and function in the endometrium of cows.]**—Zbl. VetMed. **7,** 429-476. [Summaries in English, French and Spanish.] **1980**

From 12 heifers and 9 cows aged 2 and 3 years, all normal over two observed cycles, 41 biopsy samples taken by Grunert's method were examined; each sample was quadrisected, three were studied by histochemical techniques and the fourth was fixed in buffered osmic acid for electron microscopy. Sections 2–400 Å thick were cut with a Sartorius-ultramicrotome and examined with a Siemens instrument at 60–80 Kv. Fifty-one uteruses from random slaughtered cows were also used for cytometry using the light microscope.

Evidence was obtained that the endometrium constitutes typical reticulohistiocyte tissue. The phagocytic activity of the macrophages, mostly on cell debris and blood pigment, is most conspicuous in the regression phase of the cycle. The break-down blood pigment is ceroid unlike that produced in the spleen and is apparent between the 15th–20th days. Lymphocytes were absent from 23 of 25 heifers but were always present in parous animals; plasma cells never occurred in absence of lymphocytes and were closely associated with the lymph nodes, of which the development was attributed to trauma from repeated biopsy. There was evidence that lymphocytes and plasma cells have a common origin and that antibodies are produced in the cytoplasmic vacuoles of plasma cells.

As regards mast cells, evidence was obtained that their cyclic degranulation in the luteal phase implies a true histochemical ripening process; the acid mucopolysaccharides involved may be originally produced in the cell nuclei and are thought to control tissue permeability and fluid exchange.
—F. L. M. Dawson.

Mouzas, G. L. & Weiss, J. B. (1961). **Biological method for detection of parathyroid hormone.**—Brit. med. J. January 21st, 181-182. [Authors' summary.] **1981**

Parathyroidectomized rats respond to small doses of parathormone by a significant elevation of the serum alkaline phosphatase.

It is suggested that this affords a more sensitive index of parathormone activity than previously described methods.

Walker, F. G., Bensley, S. H. & Lindsay, W. K. (1961). **The effects of an antihistamine (promethazine) on the reaction of tendons to trauma—a histological study.** — Canad. J. Biochem. Physiol. **39**, 89-101. [Authors' abst. modified.] **1982**

As a part of a study on the healing of flexor tendons, the effects of promethazine were studied in 109 chickens. Minimal surgical trauma applied to an intact flexor tendon produces a marked reaction consisting of a degenerative phase, a phase of undifferentiation, and a phase of regeneration and maturation. Histological studies revealed that collagen fibres and bundles, though non-living, are not inert and permanent structures. They can break down, completely disappear, and be re-formed as a result of the reaction to trauma of specialized tenocytes and undifferentiated mesenchymal cells of the tendon and epitendon. The effects of promethazine are to prolong the phase of degeneration and loss of differentiation and, upon withdrawal, to accelerate the phase of growth and maturation. These effects vary with dose and method of administration.

Kühn, H. & Oberröder, C. (1960). Zur topographischen Anatomie der Regio lumbalis und der Regio sacralis des Schafes, unter besonderer Berücksichtigung der Rückenmarkshäute und der zwischen diesen liegenden Spalträume. **[Topographical anatomy of lumbar and sacral regions in sheep with special reference to the meninges and the meningeal spaces.]** — Zbl. VetMed. **7**, 878-903. [Summaries in English, French and Spanish.] **1983**

A detailed description of lumbo-sacral anatomy in 15 sheep for guidance in avoiding damage to the cord, vertebral sinuses and intervertebral arteries in epidural anaesthesia or when collecting cerebrospinal fluid.—E.G.

Ford, E. J. H. (1961). **Metabolic changes in cattle near the time of parturition. II. Hepatic fat and glycogen content, together with glucose-6-phosphatase, phosphorylase and β-glucuronidase activity of liver.** — J. comp. Path. **71**, 60-70. [Author's conclusions modified.] **1984**

In the liver of the normal parturient cow there is a significant increase in extractable fat and a significant fall in glycogen, and in phosphorylase activity. There is also a significant increase in hepatic β-glucuronidase activity whilst glucose-6-phosphatase activity does not change.

Pierce, A. E. (1960). **β-Lactoglobulins in the urine of the new-born suckled calf.**—Nature, Lond. **188**, 940-941. **1985**

Certain proteins in bovine colostrum contribute to proteinuria in the sucking calf lasting 30–40 hours after birth. Present findings support previous ones but emphasize more specifically that it is the β-lactoglobulin in the colostrum which together with the immune lactoglobulin, is absorbed from the gut during the period of gut permeability immediately after birth. This protein is afterwards selectively cleared from the circulation (probably by glomerular filtration) and gives rise to β-lactoglobulinuria. The immune lactoglobulin is largely retained. Aschaffenburg and Drewry's findings that there are two lactoglobulins, A and B, and that the presence of either or both can be determined genetically, were confirmed by starch gel electrophoresis, patterns of which, are illustrated and discussed. The origin, nature and function of the immune lactoglobulin and the β-lactoglobulin are discussed.—T.E.G.R.

Massey, J. W. (1960). **Physiological and genetic influence of insulin-induced stress on the blood components and their association with rate of gain at various phases of the growth curve in beef cattle.** — Dissertation, Missouri pp. 190. [Abst. from Diss. Abstr. **21**, 8.] **1986**

A study was made of the physiological response of yearling bulls to insulin-induced stress, as measured by changes in blood glucose and in white cells in the blood before and after insulin injections.

The results agreed with those of other studies on laboratory animals, and they suggest that a study of the blood components before and after stress might be useful in measuring the level of production of certain pituitary and adrenal hormones in live cattle. —R.M.

Field, A. C. (1960). **Uptake of magnesium-28 by the skeleton of a sheep.**—Nature, Lond. **188**, 1205. **1987**

A sheep aged 5 years and weighing about 65 kg. after 6 days on a diet of grass nuts containing 1·2 g. Mg was given 40–60 μc. carrier-free Mg^{28} (as the chloride) into the jugular vein and bled to death 10 hours later. Duplicate samples of bone (free, as far as possible, from blood and marrow) were taken from various parts of the skeleton and their radioactivity was measured the same day.

Specific activity varied from bone to bone and was greater in regions of rapid bone metabolism than in compact bone. The overall percentage of bone Mg in equilibrium with the Mg in body fluids was low and ranged from 0·86 to 2·3%. The variation in specific activity of individual bones was of the same order as magnesium depletion in the corresponding bones from Mg depleted calves. There are no analytical figures in the literature for the skeletal Mg content of adult cattle or sheep but estimates can be made from the calcium content of the skeleton and the Ca/Mg ratio in the bones. Reserves and mobilization of bone Mg in cattle and sheep are discussed. —T.E.G.R.

See also absts. **2032** (book, comparative physiology); **2034** (book, the avian embryo).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Schreiter, M. (1960). Bakteriologische Fleischuntersuchung obligatorisch für alle Schlachtpferde oder nicht? **[Should bacteriological meat inspection of horse carcasses be obligatory?]**—Mh. VetMed. **15,** 888-890. **1988**

In East Germany all slaughtered horses are examined bacteriologically. Since only 11 (0·16%) of 6,721 horse carcasses yielded salmonella, and all 11 had suspicious symptoms or lesions, it was proposed that bacteriological examination of healthy slaughter horses is unnecessary.—M.G.G.

Bache, C. A., Gyrisco, G. G., Fertig, S. N., Huddleston, E. W., Lisk, D. J., Fox, F. H., Trimberger, G. W. & Holland, R. F. (1960). **Effects of feeding low levels of heptachlor epoxide to dairy cows on residues and off-flavors in milk.**—J. agric. Food Chem. **8,** 408-409. **1989**

Heptachlor epoxide was fed for 2 weeks to 6 dairy cows at 0·5 or 1 p.p.m. of the roughage intake. Analysis of the butter fat revealed residues of up to 0·38 and 1·94 p.p.m. for the 2 rates of intake respectively. No flavour or odour attributable to the parasiticide was detected.—M.G.G.

Gyrisco, G. G., Lisk, D. J., Fertig, S. N., Huddleston, E. W., Fox, F. H., Holland, R. F. & Trimberger, G. W. (1960). **The effects of feeding high levels of Sevin on residue, flavor, and odor of the milk of dairy cattle.** — J. agric. Food Chem. **8,** 409-410. **1990**

Sevin (1-naphthyl-*N*-methylcarbamate) was fed for 2 weeks to 15 cows at 50, 150 or 450 p.p.m. of the roughage intake. A test capable of detecting 0·01 p.p.m. of Sevin failed to reveal any residues in the milk. No flavour or odour attributable to the parasiticide was noticed.—M.G.G.

Radeleff, R. D. & Claborn, H. V. (1960). **Excretion of Co-Ral in the milk of dairy cattle.** — J. agric. Food Chem. **8,** 437-439. **1991**

A cow was sprayed with 2 litres of 0·5% Co-Ral emulsion labelled with P^{32}, and another with 2 litres of 0·75% emulsion. The maximum concentrations of labelled "organo-soluble material" in the milk—0·2 p.p.m. and 0·25 p.p.m. respectively—were reached 5 hours after treatment. The concentrations declined gradually during the next 7 days and only traces were present after 10 days.—M.G.G.

Dorough, H. W., Brady, U. E., Jr., Timmerman, J. A., Jr. & Arthur, B. W. (1961). **I. Residues in tissues and eggs of poultry dusted with Co-Ral (Bayer 21/199). II. Residues in tissues and eggs of poultry receiving Co-Ral (Bayer 21/199) in the feed.** —J. econ. Ent. **54,** 25-30 & 97-100. [Authors' summaries modified.] **1992**

I. Thirty hens were dusted with P^{32}-labelled Bayer 21/199 at 50 mg./kg. Twenty were dusted once, and 10 twice at weekly intervals. Some intact insecticide remained on the feathers and skin for 28 days. The liver, kidney, and bones contained more radio-activity than other internal tissues. By 3 days after treatment, acetonitrile-soluble insecticide residues in internal tissues were negligible. The eggs contained minute quantities of residues 5 to 7 days after treatment of the hens, but these residues were not identified as Bayer 21/199 or its oxygen analogue. Radio-active materials excreted in the faeces consisted of residual insecticide, the oxygen analogue, *O, O*-diethyl phosphoric acid, and *O, O*-diethyl phosphorothioic acid. Phospholipids, ribonucleic acid, deoxyribonucleic acid and acid-soluble phosphorus compounds were isolated from the liver and faeces.

II. Labelled insecticide was mixed in mash at 10 p.p.m. and fed to laying hens for 7 days. The highest concentration of total radio-active

residues was in the liver and kidney; deposition in fat was slight. Liver, kidney, and gizzard contained the highest concentration of acetonitrile-soluble insecticide residues, but these were absent from all tissues 7 days after the hens returned to normal feed. Small but detectable amounts of residue were present in egg yolks 11 to 15 days after treatment, but none in the albumen.

About 79% of the radio-activity consumed in the food was excreted in the faeces by 28 days after treatment, and more than 85% of the excreted radio-active materials were hydrolytic products. Unchanged insecticide, its oxygen analogue and *O, O*-diethyl phosphorothioic acid were identified in the faeces.

Chilwell, E. D. & Hartley, G. S. (1961). **Determination of residual organo-phosphorus insecticides in foodstuffs. A review.**—Analyst **86**, 148-159. **1993**

Among the 17 insecticides dealt with are demeton, Dipterex, diazinon, dimethoate, Delnav, malathion, parathion.—R.M.

Kemmerer, A. R., Heywang, B. W. & Vavich, M. G. (1960). **Effect of Sterculia foetida oil on gossypol discoloration in cold storage eggs.**—Poult. Sci. **39**, 1264. **1994**

Discoloration of the yolk of eggs stored for 3 months at 5°C. caused by feeding 3–6 mg. gossypol daily to the hens was enhanced when the hens were given in addition 25 or 50 mg. of *S. foetida* oil daily.—M.G.G.

LIVESTOCK HYGIENE

Harvey, C. N. (1960). **A bibliography of farm buildings research 1945-1958. Part IV. Buildings for cattle.** pp. 84. Agricultural Research Council. 4s. 6d. **1995**

There are 366 abstracts in this bibliography and an author index. A key classifies the items under the following heads: environmental needs of adult cattle; housing the dairy herd (with sections on cow houses and loose housing); buildings for milk production; buildings for beef cattle; buildings for calves. —R.M.

Semenyuta, A. T. (1960). **[Climatic conditions in byres having four rows of stalls.]**—Veterinariya, Moscow No. 11 pp. 75-78. [In Russian.] **1996**

S. made very numerous measurements of temperature, humidity, air movement, ammonia concentration, carbon dioxide concentration and also body temp., pulse, respiration, skin temp. of cows in a building 76 m. long and 20 m. wide with a capacity of 6,400 cu. metres, housing 120 cows, in the Rostov area (relatively mild climate). During winter when the inside air temp. averaged 9·8°C. (outside temp. minus 3·2°) at a relative humidity of 85·8% physiological state of the cows was normal, but during the transition from winter to spring when temp. rose to 15° and r.h. to 92·6% there were increases in pulse, respiration and skin temp. The author recommended a reduction in the size of a standing for one cow to 115–120 cm. wide and 175 cm. long.

Ventilator intakes were in the form of bent pipes at window level having a total cross-sectional area of 2 sq. m., while extraction was by means of two pipes having a total area of 3·06 sq. m. The average speed of air flow in the latter was 1·65 metres a sec. in winter and 1·55 in spring; their area was insufficient to prevent high temperatures (12°) building up within the building during spring (outside temp. 5°).—R.M.

Komarov, N. M. (1960). **[Improving ventilation of animal buildings.]** — Vestn. sel'skokhoz. Nauki No. 10 pp. 71-76. [In Russian. Summaries in English, French and German.] **1997**

K. discussed the effect of ventilation on microclimate and animal health, the different systems of ventilation used in the U.S.S.R., and the correct use of ventilation systems. A table gives the number of cubic metres of fresh air each hour required by cattle, horses, pigs, sheep and fowls, and the cross-section of the outlet pipes for animal buildings in 4 zones of different winter temperature in the U.S.S.R. —M.G.G.

Hoflund, S. (1961). Wasserverunreinigungen als Krankheitsursache in Rinder- und Schafbeständen. **[Water pollution as cause of disease in cattle and sheep.]** — Dtsch. tierärztl. Wschr. **68**, 97-100. [Summary in English.] **1998**

Abnormal fermentation in the rumen, intestinal catarrh, diarrhoea etc., in cattle and sheep in Sweden, due to normally saprophytic micro-organisms in polluted drinking water,

were discussed. Disturbances in the equilibrium of the normal flora by such organisms may affect digestion and synthesis of vital substances, and may result in metabolic disorders, particularly in high yielding cows.

The role of polluted water in the dissemination of pathogenic bacteria is illustrated by an outbreak of *Salmonella cholerae-suis* infection in a herd of 96 cattle, 20 of which died. The pasture was contaminated by waste water from an infected piggery. An outbreak of diarrhoea due to *S. typhi-murium* in 30 cows was traced to water polluted by waste from a housing site. Of 150 sheep 20 died of *S. typhi-murium* infection after drinking polluted lake water. Ten sheep of a flock died from clostridium infection after flood water had contaminated a well. The role of water in mastitis, brucellosis and dissemination of helminth parasites was also discussed.—E.G.

Norman, M. J. T. (1960). **Grazing and feeding trials with beef cattle at Katherine N.T.** — Tech. Pap. Div. Land Res. reg. Surv., C.S.I.R.O., Aust. No. 12. pp. 15. **1999**

Four trials were carried out between 1956 and 1959, each in two successive years. (1) Effects of phosphate supplementation and regular spraying with DDT on liveweight gains of cattle grazing native pasture in the wet season were examined. In both seasons, the advantage in liveweight due to phosphate supplementation after 6 months was 26 lb./head. In the first season, with heavy tick infestation, liveweight of regularly sprayed cattle was 90 lb./head greater than that of unsprayed cattle at the end of the period. In the second season, with light tick infestation, the difference was 28 lb./head. (2) Liveweight gains of cattle on native pasture during the wet season under three systems of grazing management were compared. In both years, cattle grazing continuously on pasture burned in the previous dry season gained on average 0·32 lb./day more over 6 months than cattle grazing continuously on unburned pasture or cattle on a rotational system.

REPRODUCTION AND REPRODUCTIVE DISORDERS

Emmens, C. W. (1960). **Insemination pH and the sex ratio in rabbits.**—J. Hered. **51,** 156-158. **2000**

The sex-ratio in litters of artificially inseminated rabbit does was not affected by exposure of the semen to environments of varying pH.—E.G.

Szumowski, P. (1960). Insémination artificielle chez les palmipèdes. [**Artificial insemination in ducks and geese.**]—Rec. Méd. vét. **136,** 1165-1205. [Summaries in English and Spanish.] **2001**

A detailed account of the techniques for the collection and examination of semen and for insemination.—T.E.G.R.

Jacob, W. K. (1961). Bullengesundheitsdienst bei Deckbullen. [**A health service for breeding bulls.**]—Mh. VetMed. **16,** 96-101. **2002**

Of 139 breeding bulls, examined in Thuringia, three were infected with *Vibrio fetus,* one with *Trichomonas foetus,* two with both and one with coital vesicular exanthema. In five there was dysfunction of the retractor penis muscle. A.I. bulls were not included in this survey. Improvement of hygienic conditions, prevention of overwork, care of the foot, keeping of records and testing for brucellosis and TB. were discussed.—E.G.

Olsen, M. W. (1960). **Nine year summary of parthenogenesis in turkeys.**—Proc. Soc. exp. Biol., N.Y. **105,** 279-281. [Author's summary modified.] **2003**

A breeding scheme for increasing parthenogenetic development, based on the progeny test method, was initiated in 1954. More than 42,000 eggs from 926 Beltsville Small White virgin turkey hens were involved in this 9-year study. A marked increase in incidence of parthenogenesis, particularly of the more highly organized type, has resulted. Parthenogenetic development was observed in 16·7% of the eggs tested in 1952, in 41·7% in 1959. In 1952, embryos were encountered in 0·2% of all eggs whereas in 1959 11·7% of the eggs were so classified. Of 44 embryos found in 1954, 4 or 9% survived until 21–28 days of incubation; in 1960, 87 of 277 or 31·4% did so. Since 1956 a total of 67 embryos, all males, have survived to hatching, a few reaching maturity. Three males produced spermatozoa and one sired offspring.

Horváth, G. (1960). **Diagnostic significance of the crystallization of cervical mucus.** — Acta vet. Acad. Sci. hung. **10,** 449-461. [In English.] **2004**

Crystallization patterns of cervical mucus from 69 mares, 36 cows and 18 bitches were

studied in connexion with determination of ovarian function and phase of cycle, diagnosis of nymphomania caused by cystic ovaries in mares and cows, diagnosis of pregnancy in mares and determination of the right mating time in bitches.—E.G.

Rommel, W. & Rommel, P. (1960). Vergleichende experimentelle Untersuchungen zur komplexen Darstellung verschiedener Funktionszustände im Genitale des Rindes während individueller Brunstzyklen. **[Comparative study of the different functional stages of the bovine genital system during individual oestrous cycles.]** — Zuchthyg. FortpflStörung. u. Besamung **4,** 376-396. [Summaries in English and Russian.] **2005**

Determination of the functional stage of the genital system in four cows by clinical examination, uterine biopsy, vaginal biopsy, cytological study of vaginal smears, determination of the pH of uterine and vaginal mucus, and urinary excretion of 17-ketosteroids was described.—E.G.

Edgar, D. G. & Asdell, S. A. (1960). **I. The valve-like action of the utero-tubal junction of the ewe. II. Spermatozoa in the female genital tract.**—J. Endocrin. **21,** 315-320 & 321-326. [Authors' summaries modified.] **2006**

I. At and for about 3 days after oestrus the utero-tubal junction of the ewe has a valve-like action which prevents fluid under pressure in the Fallopian tube from entering the uterus.

This action appears to be the result of oestrogen-induced oedema and flexure of the wall of the utero-tubal junction.

II. Ram spermatozoa were found at the ovarian end of the Fallopian tubes of ewes at about 3 hours after mating. No radiopaque medium passed from the vagina to the uterine horns of rabbits following vulval stimulation and copulation. Ram spermatozoa entered the tubes of ewes through a valve-like utero-tubal junction which prevented fluid passing in the opposite direction. Almost all ram spermatozoa became immotile within 8 hours of their introduction into the tubes of ewes. The method of sperm transport in the female genital tract is discussed.

Saleĭ, P. I. & Krutyporokh, F. I. (1959). **[Action of neostigmine and pituitrin on uterine contractions in sows.]** — Trudy Voronezh. zootekh.-vet. Inst. **16,** 283-287. [In Russian.] **2007**

The diagnosis of uterine inertia in sows was based on three criteria: frequency of delivery, duration and intensity of labour. Stimulation of uterine contractions was advised when contractions were infrequent, brief and weak. For this purpose s/c inj. of proserine (neostigmine) at 0·5 mg./100 kg. body wt. or pituitrin at 1·5 ml./100 kg. was recommended. Injection could be repeated once after 25–30 min.—R.M.

Věžník, Z. (1960). Biopsie endometria. (Popis nové aparatury k odběru vzorků sliznice děložní). **[Apparatus for endometrium biopsy.]**—Věd. Práce Ustavu vet. Brno **1,** 215-225. [In Czech. Summaries in German and Russian.] **2008**

An illustrated description of an automatic uterine biopsy apparatus. It consists of a pistol shaped, piston-operated suction mechanism to which a special hollow curette is attached. The mechanical part, which remains outside the animal, need not be sterilized. By changing the curette part, it can be adapted to various species of animals.

—E.G.

Dawson, F. L. M. (1960). **Bovine endometritis: a review.**—Brit. vet. J. **116,** 448-466. **2009**

Richter's clinical classification of endometritis is still followed with minor individual modifications. First degree, absent or intermittent discharge; second, continuous mucopurulent discharge; third, purely purulent discharge. Bacteriology is discussed. Usual bacteria are staphylococci (non-haemolytic more frequent than haemolytic), *Escherichia coli,* streptococci (α or β haemolytic) and anthracoids *(Proteus vulgaris, Pseudomonas pyocyanea* and *Neisseria* spp. occuring rather consistently as minority organisms); in third degree types *Corynebacterium pyogenes* is of outstanding importance. Treatment is mainly local—with chemical disinfectants, oestrogens and antibiotics as the chief agents. Lugol's iodine solution is still considered an effective remedy in first degree infection, though furan and sulphone compounds may be somewhat superior (especially in second and third degree types). Restoration (spontaneous or induced) of the oestrous cycle has a beneficial effect on the uterus. Results of controlled trials indicate that penicillin, chlortetracycline, streptomycin and oxytetracycline all seem reasonably effective in single doses, though possibly less so when *C. pyogenes* is involved. Suggestions are made regarding the pattern of further research on treatment and control of the disease.—T.E.G.R.

Tsolov, V. (1960). **[Histology of retained placentas of cows.]**—Izv. Inst. Pat. Zhivotni, Sofia **8**, 53-64. [In Bulgarian. Summaries in German and Russian.] **2010**

Placental retention not due to brucellosis or TB. was common on some farms in Bulgaria. Thus on one farm retention occurred in 68 of 189 calvings in one year and in 38 calvings the next year. T. examined histologically portions of 10 placentas discharged normally and from 11 retained placentas, mostly in cows that had calved normally, collected 12–36 hours after calving.

There was no evidence of inflammation in foetal or maternal parts of retained placentas. In 7 of the 11 cases, retention was attributed to retardation of the normal dystrophy that occurs in caruncles.—R.M.

Mahaffey, L. W. (1960). **Foetal deaths. A general survey.** — J. R. Army vet. Cps **31**, 19-25 & 116-124. **2011**

This article, which also appeared in "The British Racehorse", discusses the causes of abortion in mares and death in foals. Figures of foal losses for the period 1930–57 have been compiled from the Thoroughbred Breeders' Association's statistical abstracts. The figures were fairly constant each year: about a quarter of the 5,000 or so mares served each year did not conceive; in mares that became pregnant, about one in ten lost their foals. Abortion occurred in 2 or 3% of mares served. —R.M.

I. Lindner, H. R. & Mann, T. (1960). **Relationship between the content of androgenic steroids in the testes and the secretory activity of the seminal vesicles in the bull.**—J. Endocrin. **21**, 341-360. **2012**

II. Mann, T., Rowson, L. E. A. & Hay, M. F. (1960). **Evaluation of androgenic and gonadotrophic activity in male twin calves by analysis of seminal vesicles and semen.**—Ibid. 361-372. [Authors' summaries modified.] **2013**

I. Testosterone and androstenedione were determined chemically in testicles of bulls aged from 28 days to 17½ years. The earliest age at which it was possible to detect both steroids was 39 days.

The ratio androstenedione/testosterone decreased with age. In immature bull calves, less than 4 months old, it exceeded 1 : 1, in animals above 9 months of age it was less than 1 : 10.

The appearance of chemically demonstrable amounts of testosterone and androstenedione in the testicles of calves coincided with the onset of production of fructose and citric acid by the seminal vesicles. In adult bulls the testicular content of testosterone was significantly correlated with the weight, fructose content and citric-acid content of the seminal vesicles.

II. In pubescent male twin calves the onset of the secretory function of seminal vesicles, as reflected in the appearance of fructose and citric acid in ejaculates, was advanced by injections of chorionic gonadotrophin. However, in much younger bull calves gonadotrophin was incapable of evoking a similar response. On the other hand, testosterone injected into immature animals readily induced high secretory activity in the seminal vesicles.

When androstenedione was injected into castrated bull calves, its androgenic effect on the formation of fructose and citric acid in the seminal vesicles was negligible by comparison with the powerful stimulating influence of testosterone. This probably explains why in young bull calves fructose and citric acid are not secreted by the seminal vesicles until the testicular content of testosterone markedly exceeds that of androstenedione.

Underfeeding of bull calves not only delays the onset of secretory activity in the seminal vesicles as a result of decreased androgenic activity of the testicles but also diminishes the responsiveness of the seminal vesicles to testosterone.

Hansel, W., McEntee, K. & Wagner, W. C. (1960). **Conception rates of repeat-breeder cows bred after progesterone and chorionic gonadotrophin treatments during estrus.**—Cornell Vet. **50**, 497-502. **2014**

Of 104 cows which had failed to hold after two or more inseminations 28 (controls) were injected with saline, 36 were treated with 20 mg. progesterone and 40 with 2,000 i.u. of chorionic gonadotrophin (LH). In the controls and the progesterone group the conception rate was equal and normal 50–75%, but only 35% in the LH group. The authors conclude that the treatment in fact lowered the conception rate and suggest that such treatment should be used only on known late ovulators.

[There is little evidence that less than 100 mg. progesterone is an effective therapeutic dose. The authors' claim to have eliminated oviduct dysfunction cases cannot be admitted on the details given. Few advocate

LH treatment as early as at the time of service.]—F. L. M. Dawson.

Bengtsson, L. P. & Schofield, B. M. (1960). **Hormonal control of myometrial function during pregnancy in the sheep.**—J. Reprod. Fertil. **1,** 402-409. [Authors' summary modified.] **2015**

Thirteen sheep were studied during the last month of pregnancy to assess progesterone influence on the myometrium. The results, both *in vivo* and *in vitro,* demonstrate that the progesterone influence declines before parturition and it is concluded that the extrusion of the foetus is accomplished by an oestrogen-dominated myometrium. This finding is discussed in relation to the fact that no fall in the progesterone level in blood can be detected before parturition. The oxytocin thresholds determined in ewes suggest that the sensitivity of the myometrium increases with the approach to parturition.

Bradbury, J. T. (1961). **Direct action of estrogen on the ovary of the immature rat.** —Endocrinology **68,** 115-120. [Author's abst. modified.] **2016**

Crystalline oestradiol or stilboestrol was applied to one ovary of the immature rat leaving the other untreated. The oestrogen-treated ovary exhibited several different responses: greater increase in weight; formation of corpora lutea; increased responsiveness to endogenous and exogenous gonadotrophins. In control experiments crystalline testosterone or progesterone was applied to one ovary with, or without, oestradiol being placed on the other ovary. These experiments demonstrated that oestrogen has a local stimulative effect within the ovary as well as a systemic effect through the pituitary.

Věžník, Z. (1960). Histopatologické změny ve varlatech býků ve vztahu k poruchám plodnosti. **[Histopathology of bulls' testicles in relation to sterility.]**—Věd. Práce Ustavu vet. Brno **1,** 201-215. [In Czech. Summaries in German and Russian.] **2017**

Testicular lesions in 62 bulls, discarded for low fertility, included hypoplasia, atrophy or degeneration of seminiferous epithelium, partial necrosis of parenchyma, fibrosis, orchitis, epididymitis and in two, seminoma. The author advocated testicular biopsy in addition to conventional clinical examination and cytological study of semen.—E.G.

Baehler, J.-F. (1960). Examen des cas de stérilité de la vache observés de 1869 à 1958 à la clinique ambulante de l'Université de Berne. **[Survey of sterility in cows treated at the clinic of Bern University between 1869 and 1958.]**—Schweiz. Arch. Tierheilk. **102,** 372-391 & 442-457. [In French. Summaries in English, German and Italian.] **2018**

The most important causes of sterility in cows treated at the clinic were ovarian cysts (17,090 cases) and ovarian hypofunction (5,640 cases). There were 16,311 cases of granular vaginitis, mostly due to mineral imbalance, but since 1939 the condition has become less common. Other causes of sterility were persistent corpora lutea (6,930 cases), brucellosis (2,012 abortions), abnormalities of the genital organs (594 cases), trichomoniasis (438 cases of sterility and 187 of abortion), coital vesicular exanthema (559 cases), ovarian sclerosis (547 cases), and TB. (239 cases). There were 1,223 cases of sterility without apparent cause. Vibriosis was not observed. Details were given of the different methods of treatment that were used during the period.—M.G.G.

Vlček, Z. (1960). Příspěvek k otázce vztahu bakteriální flóry v pohlavním ústroji k cystózní degeneraci Graafových folikulů u skotu. **[Relationship between genital bacterial flora in cattle and cystic ovarian degeneration.]** — Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5,** 655-668. [In Czech. Summaries in English and Russian.] **2019**

Thirteen of 25 cervical and 26 of 43 uterine mucus samples from cows with cystic ovaries were bacteriologically sterile. So were 16 of 33 vaginal mucus samples from healthy cows and 34 of 36 samples of ovarian cyst fluid.

From the remainder the following were isolated: micrococci, including *M. candidus, M. flavus, M. epidermidis, M. ureae, M. luteus, M. varians* and *M. freudenreichii*; streptococci, including *Str. faecalis* and eight strains of the *viridans* group; Enterobacteriaceae, including *Escherichia coli*; corynebacteria, including *C. bovis, C. renale, C. hoagii* and 5 saprophytic strains.

From the comparatively high proportion of bacteriologically sterile samples it was concluded that the primary cause of mucopurulent endometritis, often accompanying cystic ovarian degeneration in cows, is a hormonal disturbance, the resistance of the uterine mucosa to micro-organisms being due to the

action of oestrogens. Antibiotic treatment therefore appears to be futile, without first eliminating the primary cause of the condition. —E.G.

Flatla, J. L., Hansen, M. A. & Slagsvold, P. (1961). **Dermatosis vegetans in pigs. Symptomatology and genetics.**—Zbl. VetMed. **8,** 25-42. [In English. Summaries in French, German and Spanish.] **2020**

This inherited disease was first described by Hjärre in Sweden [*V.B.* **23,** 2954]. Of 207 offspring of litter mates, heterozygous for dermatosis vegetans, 147 survived to the age of 3 weeks; 36 were affected with skin and foot lesions. Mortality was due mainly to respiratory conditions. Foot lesions were erythema and oedema in the coronary region of the toes; the wall was thickened, brittle, and its surface uneven and furrowed. Like the foot lesions, skin lesions may be congenital but as a rule they developed during the first three weeks of life, mainly on the belly and inner surface of the thighs. At first erythematous, later they became wart-like and covered with greyish-brown crusts with a hyperaemic, raised, peripheral zone. Mortality was highest at the age of 5–8 weeks. In those which recovered there were no visible scars.

In the lung lesions there was proliferation and desquamation of the alveolar epithelium, large numbers of giant cells in alveoli, with fibrinous to purulent exudate in alveoli and bronchioles.

All 173 offspring from the matings of heterozygous with normal pigs were normal, but apparently normal offspring of a homozygous sow and a normal boar when mated among themselves produced a number of affected piglets in each litter. Incidence was about the same for both sexes. It was concluded that the condition was due to a semi-lethal factor with recessive, autosomal inheritance.—E.G.

Abbott, U. K. & Goetinck, P. F. (1960). **Splitfoot, a lethal mutation affecting the foot structure of the fowl.**—J. Hered. **51,** 161-166. **2021**

A malformation of the foot in chick embryos, characterized by duplication of the second toe and absence of the hallux, due to a recessive lethal gene, is described.—E.G.

Coleman, T. H., Ringer, R. K., Mathey, W. J., Rood, K. G. & Pope, C. W. (1960). **Vibrator, a recessive sex-linked mutation in turkeys.**—J. Hered. **51,** 158-160. **2022**

Rapid vibration of head and neck in male poults was found to be a hereditary condition, due to a single sex-linked, recessive gene. —E.G.

See also absts. **1677** (haemolytic streptococci as agents of contagious catarrhal vaginitis in cows); **1701** (a haemophilus associated with vaginitis and cervicitis in cattle); **1703** (sterility in goats); **1719-1737** (brucellosis); **1754-1755** (bovine genital vibriosis); **1798** (influenza and virus abortion in mares); **1800** (infectious orchitis in bulls); **1801** (coital vesicular exanthema); **1891** (infertility in rabbits from ladino clover); **1894** (mineral deficiency as cause of infertility in cattle); **1979** (spermatogenesis in the bull); **1980** (cell structure and function in the bovine endometrium); **2036** (book, animal breeding).

TECHNIQUE AND APPARATUS

Marshall, J. H. & Kelsey, J. C. (1960). **A standard culture medium for general bacteriology.**—J. Hyg., Camb. **58,** 367-372. **2023**

The basic medium was composed of casein digest, yeast autolysate ("Marmite"), sodium glycerophosphate, potassium lactate, glucose and a solution of inorganic salts. A wide range of standard media could be prepared from it.—R.M.

Kopp, C. & Englert, H. K. (1961). Die Proteinfraktionen des Rinder- und Schweineserums in Abhängigkeit von Entnahmezeit und Aufbewahrungstemperatur. Erfahrungen bei biochemischen Analysen: I. Mitteilung. **[Protein fractions in serum from cattle and pigs: effects of delayed examination and temperature of storage of samples.]**—Berl. Münch. tierärztl. Wschr. **74,** 61-64. [Summary in English.] **2024**

Paper electrophoresis revealed no changes in the percentage of albumin and α, β and γ globulins in ox serum stored at 6°, 20°, 28° or 37°C. for 6 days. But in pig serum there was a continuous slight decrease in γ globulin and a slight rise in albumin.—M.G.G.

Chobert, Brion & Fontaine. (1960). Injections intra-dermiques et transcutanées sans aiguille. Présentation d'un appareil. **[Intradermal injection without a needle in cow and dog.]** —Bull. Acad. vét. Fr. **33,** 507-512. **2025**

A syringe was described that forces at high pressure 0·1 ml. of liquid up to 4 mm. into the skin or underlying tissues. The operation is painless and the depth of penetration can be varied by altering the distance or inclination of the nozzle to the skin. In over 100 tuberculin tests in cattle performed with this instrument the reactions were no different

from those with a standard syringe. Other uses are anaesthesia of the skin prior to the injection of anaesthetic with an ordinary syringe, and treatment of cutaneous staphylococcal infection in dogs.—M.G.G.

Papp, E. & Venzke, W. G. (1961). **Modified method for thymectomy of the rat.** — Zbl. VetMed. **8,** 12-16. [In English. Summaries in French, German and Spanish. Authors' summary modified.] **2026**

Thymectomy was performed on 237 rats at various ages. A modified technique for rats aged 19 to 21 days was successful, simple, and virtually free from surgical complications.

BOOK REVIEWS

Cruickshank, R. [Edited by.] (1960). **Mackie and McCartney's handbook of bacteriology. A guide to the laboratory diagnosis and control of infection.** pp. xi+980. Edinburgh (& London): E. & S. Livingstone Ltd. 10th Edit. 40s. **2027**

Professor R. Cruickshank, with the collaboration of members of the Bacteriology Dept. of Edinburgh University, has revised and edited this 10th edition of "Mackie and McCartney". The title has been changed from "Handbook of Practical Bacteriology" to a "Handbook of Bacteriology". Fortunately there is still considerable emphasis on practical methods—a field in which this book has been of such great service to undergraduate and post-graduate students. The book is longer by 230 pages with 22 new chapters. These largely arise from a rearrangement of previous chapters but there are also seven new chapters on the viruses. The whole arrangement is a great improvement on previous editions and there is also a most welcome change from the old out-dated nomenclature to the more modern, internationally recognized nomenclature.

Part 1 deals with morphology, physiology and immunity and, apart from a few grammatical errors on p. 27, gives a good account of the subject although when dealing with "Virulence", no mention is made of the host.

Part II, dealing with "Technical methods" contains much valuable information and the inclusion of the Reed-Muench method for estimating the L.D.50 is a valuable addition (p. 353), as well as the formula for converting r.p.m. to r.c.f. for centrifuges. However, there seems to be a mistake in the example given (p. 295) for converting r.p.m. to r.c.f. The answer should be 3577 G or alternatively the diameter of the centrifuge is 20 cm. to give a radius of 10 cm. This would give the correct answer of 1788 G given. It is hoped that this will be rectified in the next issue. Mention could also be made in the section on cultivation in an atmosphere with added CO_2, of the use of the CO_2 indicator to check that the concentration of CO_2 is approximately correct, and of the inclusion of silica gel in containers to absorb excess moisture.

The last Part deals with pathogenic and commensal micro-organisms, dealing largely with practical aspects of laboratory diagnosis and with epidemiology.

No mention is made of Pearce & Powell's (1951) selective medium for anthrax nor of the fact that, when grown in 50% horse serum in 50% CO_2, *B. anthracis* produces a smooth mucoid growth of capsulated cells (Chu, 1950). Neither is any mention made of the unitage system for converting titres of brucella antibody to international units; and with regard to *Vibrio fetus,* it is still stated that the organism will grow best in the condensation water of sealed agar slopes and that surface growth is obtained only after repeated subculturing.

There is no doubt that this book will continue to be used by all those concerned with practical bacteriology and the revisions and improvements in the present edition will enhance its value.—W. J. Brinley Morgan.

Yuskovets, M. K. (1960). **[Brucellosis of farm animals.]** pp. 496. Moscow: Gosud. izdatel'stvo sel'skokhoz. literatury 2nd edition. 8r. 40k. [In Russian.] **2028**

Professor Yuskovets is well known for his work on brucellosis, particularly Strain 68 vaccine. Since the 1952 edition this book has been revised and enlarged. There are many points which will interest readers outside the Soviet Union, such as the discussion on spontaneous recovery from brucellosis on pages 38–41, diagnostic allergens (pp. 201–221), vaccines (pp. 229–298). There are separate chapters on brucellosis of sheep, pigs, horses and hares. Another describes the author's experiences of eradicating bovine brucellosis from the Beloruss SSR with the aid of Strain 19 vaccine (pages 307–316). The

bibliography comprises 25 pages of Russian and 5 pages of non-Russian references. An English translation would doubtless be interesting.—R.M.

Ainsworth, G. C. (1961). **Ainsworth & Bisby's dictionary of the fungi.** pp. viii+547. Kew: Commonwealth Mycological Institute. 5th Edit. 30s. **2029**

Once again, in the publication of the fifth edition of the Dictionary of the Fungi one is left to wonder at the knowledge and diligence of its authors. Unhappily, Dr. G. R. Bisby died during its preparation but he has left us the richer for a co-operative work which has become a necessity for any mycologist. For veterinary mycology it provides an unrivalled glimpse of the fungi as a whole with sufficient references from the latest literature to enable one to obtain a useful knowledge of every taxonomic group.

The section on veterinary and medical fungi provides a page and a half of invaluable information, whilst there are fifty-five entries on mycoses in the text. Entries on antibiotics (including six references under griseofulvin), authors, *e.g.* Sabouraud and Gruby, mycological methods, nomenclature and serology all give concise accounts with sources of further information indicated. Not only have five thousand entries been amended or added but the fourteen new plates of illustrations are now among the best to be found. The mark of success of this book is its five editions in the incredibly short period of eighteen years.—P. K. C. Austwick.

Potemkina, V. A. (1960). **[Helminthoses of domestic birds.]** pp. 236. Moscow: Gosud. izdatel'stvo sel'skokhoz. literatury. 2nd edit. 47k. [In Russian.] **2030**

This small textbook is divided into four parts dealing with helminth infestations of fowls, of domestic aquatic birds, of pigeons and diagnostic methods. For each genus there is a description of the parasite and its development and the epidemiology, symptoms and treatment of infestation. There are frequent references to recent literature and the bibliography comprises 6 pages of Russian and 2 of non-Russian references. There are 49 drawings, mainly of helminths. It costs the equivalent of 6s.—R.M.

Pool, W. A. [Edited by.] (1960). **The veterinary annual. Second year 1960.** pp. xxiv+359. Bristol: John Wright & Sons Ltd. Toronto: The Macmillan Co. of Canada Ltd. Baltimore: The Williams & Wilkins Co. 42s. **2031**

The first issue of The Veterinary Annual appeared in 1959 [*V.B.* **30,** 2039] and it has now become established as a concise survey of advances in many fields of veterinary science. This second issue covers the same wide field as before, and is mainly concerned with literature published in 1959. Thirty-five authors have contributed. Examples of contributions, taken at random, are: *Escherichia* and *Salmonella* infections, by A. Buxton; anaerobic infections and anthrax, by M. Sterne; protozoal diseases, by L. P. Joyner and S. B. Kendall; parasitology, by W. N. Beesley, T. E. Gibson and S. B. Kendall; minerals in relation to disease, by K. L. Blaxter; reproduction and reproductive disorders, by F. L. M. Dawson and L. E. Rowson; neoplasms, by J. G. Campbell; poisoning, by R. J. Garner and D. S. Papworth; surgery and obstetrics, by G. H. Arthur.

In addition there are eight special articles, including veterinary affairs in the U.S.A. (J. F. Smithcors), in British Colonial territories (R. S. Marshall); and in France (A. J. Brion). Also, diseases of poultry in the Netherlands (J. Jansen), the poultry industry of Great Britain (R. Coles), and brucella's challenge (W. Dalrymple-Champneys). The book is illustrated with 32 plates of photographs.

Almost every subject is represented in The Veterinary Annual, but there is nothing at all on regional pathology (diseases of kidneys, diseases of the digestive tract, diseases of the nervous system, and so on). Various diseases that cannot be classified satisfactorily on an aetiological basis, such as bovine chronic haematuria, porcine atrophic rhinitis, heart failure in pigs, respiratory diseases of fowls, pyometra in bitches, arteriosclerosis in animals, are not mentioned.

Nevertheless The Veterinary Annual can be thoroughly recommended as a brief and cheap guide to what is new.—R.M.

von Buddenbrock, W. (1961). Vergleichende Physiologie. Band V. Physiologie der Erfolgsorgane. **[Comparative physiology. Volume V. Muscles, ciliae, light organs and electric organs.]** pp. 390. Basel (& Stuttgart): Birkhäuser. DM 54. **2032**

A very comprehensive work, dealing mainly with the comparative physiology of the organs of locomotion. There are chapters on

the histological structure, performance, chemical composition and metabolism of muscles, in vertebrates, arthropods, helminths and molluscs, structure and function of flagella and ciliae in protozoa, and of equivalent organs in spermatozoa. There are chapters dealing with the movement of protoplasm, the physiology of chromatophores, luminescence, and production of electric energy in animals. There are over 160 illustrations, mainly well executed line drawings, and 110 tables. Numerous references at the end of chapters, many as recent as 1959, add to its value. It should be of great interest to all those concerned with the comparative physiology of vertebrates as well as invertebrates. Paper, print and general turn-out are excellent. Earlier volumes in this series dealt with sense organs (vol. I, 1952), nervous system (vol. II, 1953), nutrition (vol. III, 1956) and hormones (vol. IV, 1950).

—E.G.

Brazier, M. A. B. [Edited by.] (1960). **The central nervous system and behaviour. Transactions of the third conference, February 21, 22, 23 and 24, 1960, Princeton, N.J.** pp. 475. New York: Josiah Macy, Jr. Foundation. $7.50. **2033**

The aim of this third conference is to continue the furtherance of knowledge of the central nervous system and behaviour by bringing together, for free discussion around one conference table, workers from different countries who are interested in the related disciplines such as biochemistry, pharmacology, physiology, neurology, ethology, pyschology and psychiatry. The book is a record of the discussions.

Specific subjects dealt with include the evolution of man's brain; biochemical maturation of the central nervous system; neuronal models and the (Pavlov's) orienting reflex; concepts of drive (mobbing responses of the chaffinch); affectional behaviour in the infant monkey (by the use of artificial mothers); verbal regulation of behaviour (in the child and in the defective); signalling systems (commencing with Pavlovian conditioning) in the development of cognitive functions.

A volume containing translations of seventy Russian articles dealing with the central nervous system and behaviour has been prepared. A list of these articles is appended.

—A. Brownlee.

Romanoff, A. L. (1960). **The avian embryo: structural and functional development.** pp. xvi+1305. New York (& London): The Macmillan Company. 210s. **2034**

This book is a companion to that invaluable volume "the avian egg", published in 1949. It is an effort to bring together all the known scientific facts about the structural and functional development of avian embryos. The term avian is used to cover all birds that have been studied and veterinary workers will find it useful for information on fowls, turkeys, ducks, geese, pigeons.

The author states that he has studied over 7,000 original publications for the preparation of the book. Of these, 2,700 are cited in the text. The bibliography covers the period 1722–1956 and occupies 82 pages.

The subject matter is treated organ by organ, with due attention to species differences. For example, the nervous system covers 155 pages, the organs of special sense 65 pages and the digestive system 103 pages. Illustrations, so important in embryology, are provided by 2,256 pen-and-ink drawings. There is an excellent index to subjects.

This is a monumental work. Research workers who have to deal with avian embryos cannot afford to be without it.—R.M.

Smith, R. N. (1960). **Radiography for the veterinary surgeon.** pp. 68. Bristol: John Wright & Sons Ltd. 13s. 6d. **2035**

This little book tells the practising veterinary surgeon how his X-ray machine works, how to get the best results from it, and how to develop the plates. It is concerned only with techniques and does not go into the interpretation of radiographs. Some information about contrast media and their use would make a useful addition to a future edition.

—R.M.

Kelley, R. B. (1960). **Principles and methods of animal breeding.** pp. x+358. London: Angus & Robertson. 3rd edit. 42s. **2036**

In these days of rapid development in the application of genetics to the breeding of livestock, particularly of fowls and of pigs, and of growing emphasis on the importance of progeny testing techniques in the larger animals, the traditional methods of livestock breeds are being challenged and the veterinarian will find himself out of touch with the problems facing his clients unless he can keep abreast of the changes that are taking place.

This book is not a textbook of genetics but has been written to be of assistance both to breeders and students and can be recom-

mended to veterinarians who wish to understand the newer developments and their possible repercussions on disease problems.

There is a useful chapter on artificial insemination and appendices on coefficients of inbreeding; simple biometry and a glossary of terms.

Berge, E. & Westhues, M. (1961). Tierärztliche Operationslehre. [**Veterinary surgery.**] pp. xv+399. Berlin (& Hamburg): Paul Parey. 28th edit. DM 39.60. **2037**

The previous edition of this book appeared five years ago [see *V.B.* **26,** 2762]. Since then it has been translated into Spanish, but no English edition has appeared. The eight main sections are: general surgery (sutures, anaesthesia); operations on the neck; operations on the eye; operations on the head; operations on chest, abdomen and tail; operations on urinary and genital systems; operations on limbs; casting of horses and cattle.

In the interests of clarity, uniformity, and reliability only one method has been given for a given procedure, and the authors have themselves tested the methods described. In the new edition many items have been revised and there is new information on quietening animals with the aid of tranquillizers, paravertebral anaesthesia in cattle, percutaneous fixation of fractures, collection of blood from the anterior vena cava of pigs, resection of the flexor hallucis tendon in horses, correction of patella luxation in dogs, operation for rupture of the decussate (cruciate) ligaments of the stifle joint in dogs, removal of interdigital ulcers or tumours in cattle.

A major omission is caesarian section, presumably because this is already covered in the textbook of veterinary obstetrics by Richter and Götze.

This book is concise and authoritative and very suitable for students. As there is no up-to-date equivalent in English, a translation should prove most useful.—R.M.

Franzke, H. J. & Smollich, A. (1960). Anleitung zur Exenteration. [**Guide to post-mortem technique.**] pp. viii+103. Jena: Gustav Fischer. DM 12. **2038**

The authors' justification for writing this book is that increasing numbers of students [at the Humboldt University of East Germany, in Berlin] make it difficult to give each student personal attention. The technique of making a post-mortem examination is more easily learned from practice than from a book. However, this book contains valuable information and many illustrations on topographical anatomy and there are numerous helpful practical tips: for example, on how to expose the oral cavity and how to open the thorax.

The three main sections of the book are: external inspection of the animal; demonstration of the organs of the abdominal and pelvic cavities; demonstration of the organs of the thoracic cavity and neck. There is no reference to examination of the brain and spinal cord, which is a pity because good technique is essential here. Within each chapter the procedure is described for dog, horse and ruminants. There are 76 illustrations, mostly photographs.—R.M.

Henderson, I. F. & Henderson, W. D. [Edited by Kenneth, J. H.] (1960). **A dictionary of scientific terms: pronunciation, derivation, and definition of terms in biology, botany, zoology, anatomy, cytology, genetics, embryology, physiology.** pp. xv+595. Edinburgh (& London): Oliver & Boyd. 7th Edit. 32s. **2039**

We last reviewed this book in its 5th edition [*V.B.* **23,** 3255]. Since then it has increased by 90 pages, and 1,900 new terms bring the total to around 15,600. Surprisingly, the price remains unchanged at 32 shillings, which is cheap for a work of this magnitude.

This dictionary has now grown into a large and valuable source for those biological terms that cannot be found in ordinary dictionaries, and in many ways, it is much wider in scope than the medical ones. It defines terms like lysozyme, glucagon, phytolith, dermatophyte, plaque; terms which may baffle any scientist not initiated into the special language of a given subject. While it is only too easy to detect omissions in a work of this sort, the reviewer would nevertheless like to see in a future edition definitions of the following terms, currently in common use in scientific literature: cytopathic, electrolyte, enterovirus, ganglioside, interferon, organophosphorus, properdin, zymosan.

Throughout the dictionary the derivation and pronunciation of each word are shown clearly. There are also tables of abbreviations and of metric-imperial conversion factors. It can be recommended to all research workers and librarians.—R.M.

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ERRATA

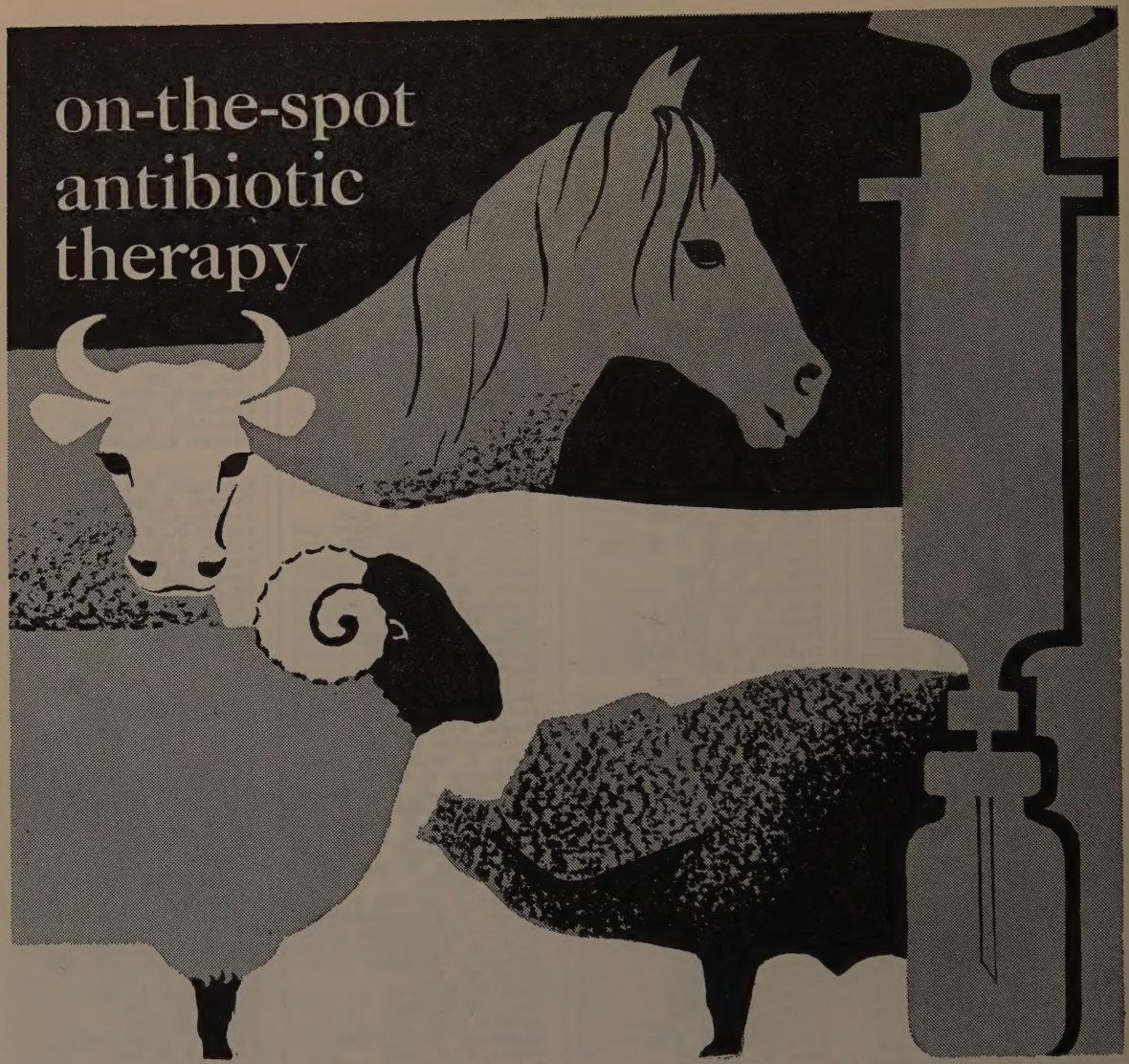
V.B. **30**, p. 355, col. 2, line 6. For "SILICOSIS" read SELENOSIS.

V.B. **31**, abst. 301. In penultimate line, for "alpha and beta haemolytic strains" read: alpha and beta toxin-producing strains.

abst. 715. Add the following sentence: "The authors pointed out that the case described by Sedlmeijer & Dahme [*V.B.* **26**, 3767] has since been shown to be toxoplasma and not pneumocystis infection".

abst. 1481. Second author's name: for "D. E. Sheffy read B. E. Sheffy.

abst. 1569. Line 7 of title, after 1008. add: [Authors' summaries modified.] Line 8 of text, delete comma after the word "type".



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